

Installation Manual

ELECTRONIC CHART DISPLAY

AND INFORMATION SYSTEM

Model FMD-3200/3200-BB/3300

SAFETY INSTRUCTIONS	i
SYSTEM CONFIGURATION	ii
EQUIPMENT LIST	iv
1. MOUNTING.....	1-1
1.1 Monitor Unit.....	1-1
1.2 ECDIS Control Unit/Track Control Unit.....	1-1
1.3 Processor Unit	1-4
1.4 Sensor Adapter MC-3000S/3010A/3020D/3030D (option)	1-6
1.5 Intelligent Hub HUB-3000 (option)	1-7
1.6 Switching HUB HUB-100 (option).....	1-8
2. WIRING.....	2-1
2.1 Processor Unit	2-2
2.2 Monitor Unit.....	2-13
2.3 Sensor Adapters (option).....	2-15
2.4 Intelligent HUB HUB-3000 (option).....	2-33
2.5 How to Extend the Control Unit Cable (option).....	2-34
3. ECN-303/304 (OPTION)	3-1
3.1 How to Install the Console	3-1
3.2 How to Dismount the Rack for the Processor Unit.....	3-2
3.3 How to Connect External Cables	3-4
3.4 How to Mount the Rack for the Processor Unit.....	3-6
APPENDIX 1 JIS CABLE GUIDE	AP-1
APPENDIX 2 ROD TERMINALS	AP-2
PACKING LISTS	A-1
OUTLINE DRAWINGS	D-1
INTERCONNECTION DIAGRAMS.....	S-1

**FURUNO ELECTRIC CO., LTD.**www.furuno.com

All brand and product names are trademarks, registered trademarks or service marks of their respective holders.



(Elemental Chlorine Free)

The paper used in this manual
is elemental chlorine free.

FURUNO ELECTRIC CO., LTD.

9-52 Ashihara-cho,
Nishinomiya, 662-8580, JAPAN

• FURUNO Authorized Distributor/Dealer

All rights reserved.

Printed in Japan

Pub. No. IME-44730-E

(REFU) FMD-3200/3200BB/3300

A : APR. 2012

E : FEB. 02, 2015



0 0 0 1 7 6 1 2 9 1 4



SAFETY INSTRUCTIONS

The installer of the equipment must read the safety instructions before attempting to install the equipment.



DANGER

Indicates a potentially hazardous situation which, if not avoided, will result in death or serious injury.



WARNING

Indicates a potentially hazardous situation which, if not avoided, could result in death or serious injury.



CAUTION

Indicates a potentially hazardous situation which, if not avoided, can result in minor or moderate injury.



Warning, Caution



Prohibitive Action



Mandatory Action



WARNING



Do not open the equipment unless totally familiar with electrical circuits and service manual.

**ELECTRICAL
SHOCK
HAZARD**

Only qualified personnel should work inside the equipment.

Turn off the power at the mains switch-board before beginning the installation. Fire, electrical shock or serious injury can result if the power is left on or is applied while the equipment is being installed.

Be sure that the power supply is compatible with the voltage rating of the equipment.

Connection of an incorrect power supply can cause fire or damage the equipment.

Use only the specified power cable.

Fire or damage to the equipment can result if a different cable is used.

Do not install the monitor unit, processor unit or control unit where they may get wet from rain or water splash, or in a dusty environment. Water in the units can result in fire, electrical shock, or damage the equipment.



WARNING



Attach protective earth securely to the ship's body. The protective earth (grounding) is required for the AC power supply to prevent electrical shock.



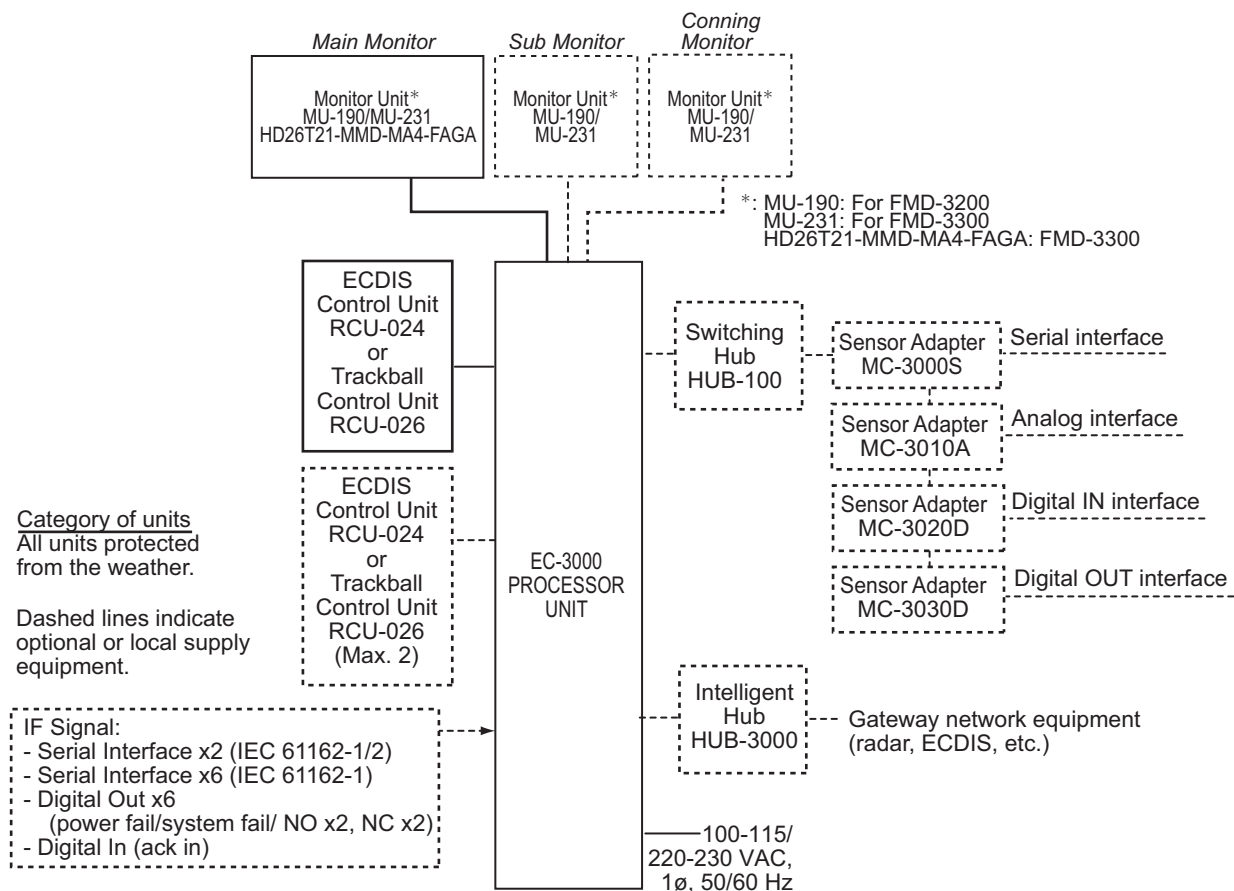
CAUTION

Observe the following compass safe distances to prevent deviation of a magnetic compass:

	Standard compass	Steering compass
Processor Unit (EC-3000)	2.40 m	1.55 m
Monitor Unit (MU-190)	1.65 m	1.05 m
Monitor Unit (MU-231)	2.55 m	1.55 m
ECDIS Control Unit (RCU-024)	0.30 m	0.30 m
Trackball Control Unit (RCU-026)	0.30 m	0.30 m
Intelligent HUB (HUB-3000)	1.20 m	0.75 m
Switching HUB (HUB-100)	1.00 m	0.60 m
Sensor Adapter (MC-3000S)	2.05 m	1.35 m
Sensor Adapter (MC-3010A)	0.75 m	0.50 m
Sensor Adapter (MC-3020D)	1.05 m	0.70 m
Sensor Adapter (MC-3030D)	0.90 m	0.60 m

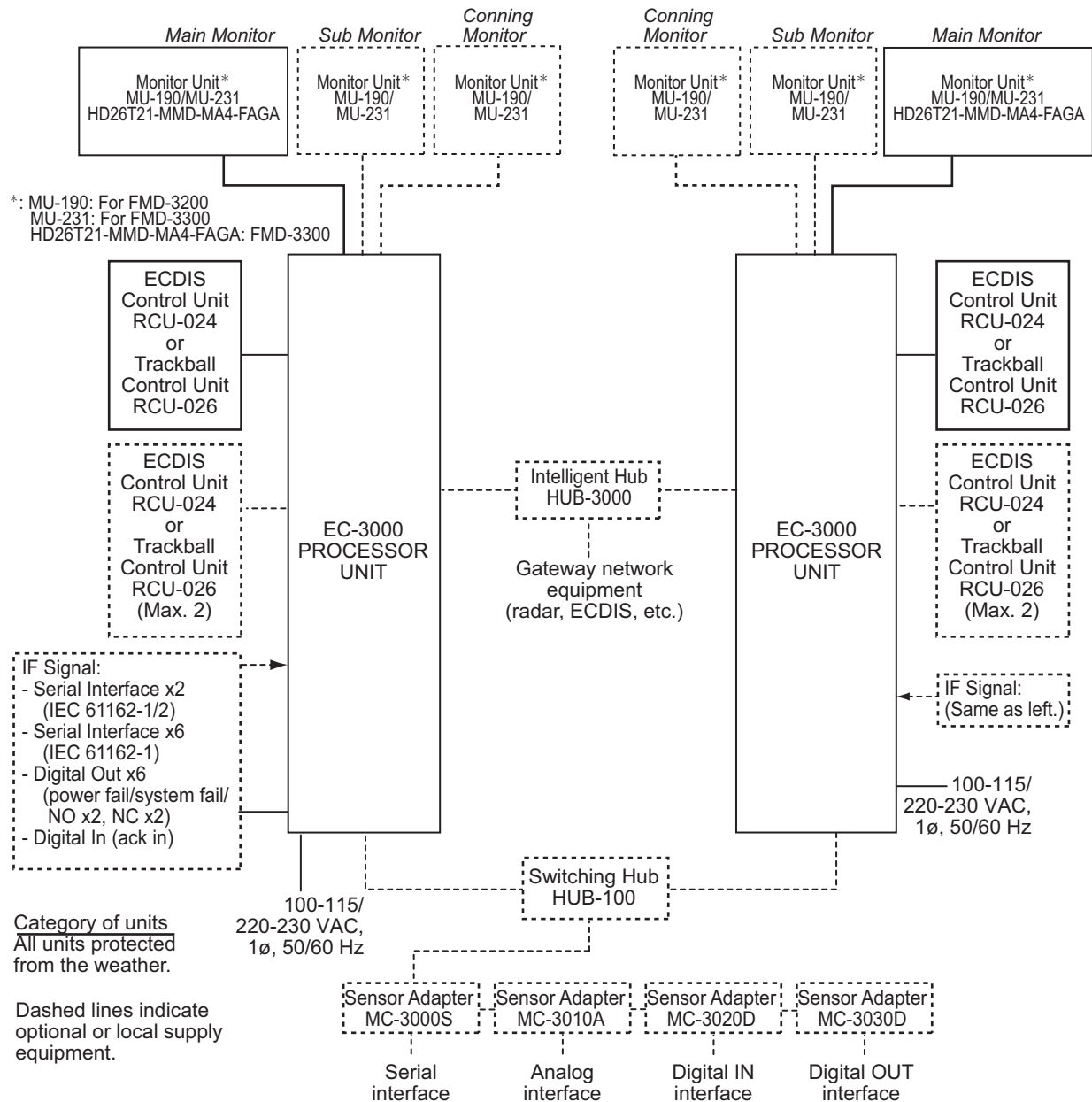
SYSTEM CONFIGURATION

System with one processor unit



Note: The following monitors are available with the FMD-3200-BB:

Maker	Model	Viewing distance (m)
FURUNO	MU-190	1.0138
	MU-231	1.0138
	MU-201CE	1.0759
	MU-231CE	1.0138
Hatteland	JH19T14FUD	1.0138
	JH20T17FUD	0.8793
	JH23T12FUD	1.0138
	JH23T14FUD	1.0138
	HD24T21MMD	0.9517
	JH26T11MMD	0.9879
	HD26T21MMD	0.9879

System with two processor units

Note: The following monitors are available with the FMD-3200-BB:

Maker	Model	Viewing distance (m)
FURUNO	MU-190	1.0138
	MU-231	1.0138
	MU-201CE	1.0759
	MU-231CE	1.0138
Hatteland	JH19T14FUD	1.0138
	JH20T17FUD	0.8793
	JH23T12FUD	1.0138
	JH23T14FUD	1.0138
	HD24T21MMD	0.9517
	JH26T11MMD	0.9879
	HD26T21MMD	0.9879

EQUIPMENT LIST

Standard Supply

Name	Type	Code No.	Qty	Remarks
Monitor Unit	MU-190	-	1	For FMD-3200
	MU-231	-		For FMD-3300
	HD26T21-MMD-MA4-FAGA	-		For FMD-3300, supplied for the HK specification.
Processor Unit	EC-3000	-	1	
ECDIS Control Unit	RCU-024	-	1	
Trackball Control Unit	RCU-026	-	1	
Installation Materials	CP24-02100	000-020-557	1	CP24-02101 and cables
	CP24-02201	001-170-810	1	For RCU-024
	CP24-02301	001-170-910	1	For RCU-026
Accessories	FP24-00602	001-258-610	1	For EC-3000
	FP24-00701	001-170-820	1	For RCU-024
	FP24-00801	001-170-920	1	For RCU-026
Spare Parts	SP24-00601	001-170-660	1	For 100VAC
	SP24-00602	001-170-670	1	For 220VAC

Console Type

Name	Type	Code No.	Qty	Remarks
Display Unit	ECN-303	-	1	w/FMD-3300
	ECN-304	-	1	w/FMD-3200

Optional Supply

Name	Type	Code No.	Remarks
Intelligent HUB	HUB-3000	-	
Sensor Adapter	MC-3000S	-	Serial IN/OUT type, w/CP24-02401 and SP24-00701
	MC-3010A	-	Analog IN, w/CP24-02501
	MC-3020D	-	Digital IN, w/CP24-02601
	MC-3030D	-	Digital OUT, w/CP24-02701
Case Gasket	OP24-28	001-169-970	For MC-3000S
	OP24-29	001-169-960	For MC-3010A/3020D/3030D
IPX2 Kit	OP24-23	001-171-780	For EC-3000
Flush Mount	OP24-24	001-171-790	For RCU-024
	OP24-27	001-171-820	For RCU-026
Connection Stand (19)	OP24-25	001-171-800	For RCU-024, FMD-3200
Connection Stand (23)	OP24-26	001-171-810	For RCU-024, FMD-3300
Trackball Control Unit	RCU-026	-	
ECDIS Control Unit	RCU-024	-	

Name	Type	Code No.	Remarks
Installation Materials	CP03-28900	000-082-658	LAN cable, 10 m
	CP03-28910	000-082-659	LAN cable, 20 m
	CP03-28920	000-082-660	LAN cable, 30 m
Spare Parts	SP24-00801	001-235-320	For HUB-3000
Switching HUB	HUB-100	-	
AC/DC Power Supply Unit	PR-240	000-013-632	
Dust Cover	26-007-1201	001-116-260-10	For MU-190
	26-007-2141	001-121-240-10	For MU-231
	03-163-7271	001-121-230-10	For console type
Bracket Assembly	OP26-5	000-016-270	For MU-190, w/knobs
	OP26-15	001-116-730	For MU-231
Hood Assembly	OP26-6	001-080-930	For MU-190
	OP26-16	001-116-740	For MU-231
Flush Mount Kit	OP26-12	001-116-280	For MU-190
	OP26-13	001-116-290	For two MU-190s
	OP26-18	000-017-273	For two MU-231s
	OP26-14	001-116-300	For three MU-190s
	OP26-19	000-017-274	For three MU-231s
	OP26-17	001-116-750	For MU-231
Mounting Bracket	OP26-21	001-139-310	For MU-190
Monitor Replacement Kit	OP26-22	001-139-320	For MU-190, flush mounting
	OP26-23	001-139-360	For MU-190, desktop mounting
	OP26-26	001-139-390	For MU-190, hood
	OP26-27	001-139-570	For MU-231, desktop mounting
Hood Assembly	OP26-24	001-139-370	For MU-190
	OP26-25	001-139-380	For MU-231
EC-3000 Attachment Kit	OP24-36	001-258-180	For EC-3000
Program Install Software	OP24-37	001-258-590	
Hand Grip Assembly	FP03-09840	008-535-570	For MU-201/231CR
Control Unit Replacement Kit	OP24-31	001-181-700	For RCU-024
Replacement Kit	OP24-50	000-027-446	
Cable	DTI-C5E350 VCV L=10M	001-197-600-10	For HUB-3000, 10 m, CAT5E
	DTI-C5E350 VCV L=20M	001-197-610-10	For HUB-3000, 20 m, CAT5E
	DTI-C5E350 VCV L=30M	001-197-620-10	For HUB-3000, 30 m, CAT5E
Terminal Opener	OP24-33	001-188-850	
Connector	CP03-28901	008-542-460	
Monitor Unit	MU-190	-	19-inch display
	MU-231	-	23-inch display

EQUIPMENT LIST

Name	Type	Code No.	Remarks
Cable Assy.	DSUB9P-X2-L5M	001-188-260	For monitor unit, 5 m
	DSUB9P-X2-L10M	001-188-270	For monitor unit, 10 m
	DSUB9P-X2-L5M-WP	000-177-053-10	For monitor unit, 5 m, waterproof type
	DSUB9P-X2-L10M-WP	000-177-247-10	For monitor unit, 5 m, waterproof type
	DSUB9P-X2-A-L5M	000-178-119-10	Brightness control cable for monitor unit, 5 m
	DSUB9P-X2-A-L10M	000-178-120-10	Brightness control cable for monitor unit, 10 m
	MC1.5-W-L600	001-187-470-10	Between sensor adapters, 0.6 m
	MC1.5-W-L1000	001-187-480-10	Between sensor adapters, 1 m
	MC1.5-W-L2000	001-187-490-10	Between sensor adapters, 2 m
	MC1.5-W-L3000	001-187-500-10	Between sensor adapters, 3 m
	6TPSH-XH12X2-L5.0SP2	001-186-310-10	For RCU-026, 5 m
	6TPSH-XH12X2-L10SP2	001-186-320-10	For RCU-026, 10 m
	6TPSH-XH12X2-L20SP2	001-186-330-10	For RCU-026, 20 m
	6TPSH-XH12X2-L30SP2	001-186-340-10	For RCU-026, 30 m
	6TPSH-XH12X2-L5.0SP1	001-186-260-10	For RCU-024, 5 m
	6TPSH-XH12X2-L10SP1	001-186-270-10	For RCU-024, 10 m
	6TPSH-XH12X2-L20SP1	001-186-280-10	For RCU-024, 20 m
	6TPSH-XH12X2-L30SP1	001-186-290-10	For RCU-024, 30 m
	DVI-D/D S-LINK 5M	001-132-960-10	For monitor unit, 5 m
	DVI-D/D S-LINK 10M	001-133-980-10	For MU-190, 10 m
	OP24-32	001-188-300	USB cable (between processor and control units), 5 m
	DVI-BNCX5-L2000	000-177-046-10	For VDR connection
Operator's Manual	OME-44730-*	000-176-125-**	English
	OMJ-44730-*	000-176-124-**	Japanese
Crimping Tool	CRIMPFOX10S	001-206-920	For ferrule

1. MOUNTING

NOTICE

Do not apply paint, anti-corrosive sealant or contact spray to coating or plastic parts of the equipment.

Those items contain organic solvents that can damage coating and plastic parts, especially plastic connectors.

1.1 Monitor Unit

To mount the monitor unit, see the operator's manual supplied with the monitor unit.

Make sure that the ground wire is connected between the earth terminal on the chassis and the ship's earth.

1.2 ECDIS Control Unit/Track Control Unit

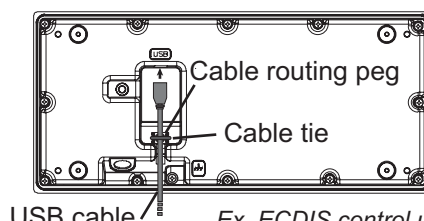
The control units can be mounted on a desktop, with or without the KB fixing metal (supplied), which mounts the control units at an angle. The control unit also can be mounted in a console panel using the optional kit.

Note: The control unit RCU-024 can be used instead of the RCU-018 (for FEA-2xx7) mounted in the connection stand (OP03-184 or OP26-20) using the option OP24-31.

Mounting considerations

When you select a mounting location, keep in mind the following points:

- Select a location where the control unit can be operated conventionally.
- Locate the unit away from heat sources because of heat that can build up inside the cabinet.
- Locate the equipment away from places subject to water splash and rain.
- Leave sufficient space at the sides and rear of the unit to facilitate maintenance.
- Determine the mounting location considering the length of the signal cable between the control unit and the processor unit.
- A magnetic compass will be affected if the control unit is placed too close to the magnetic compass. Observe the compass safe distances on page i to prevent compass malfunction.
- Make sure that the ground wire is connected between the earth terminal on the chassis and the ship's earth.
- Fasten the USB cable with the cable tie (supplied) to the cable routing peg.



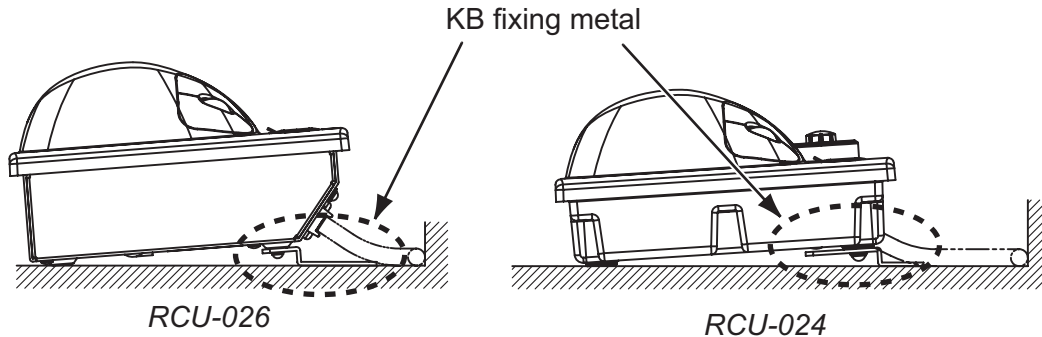
Ex. ECDIS control unit, bottom view

1. MOUNTING

1.2.1 Desktop Mounting

Fixing with KB fixing metal

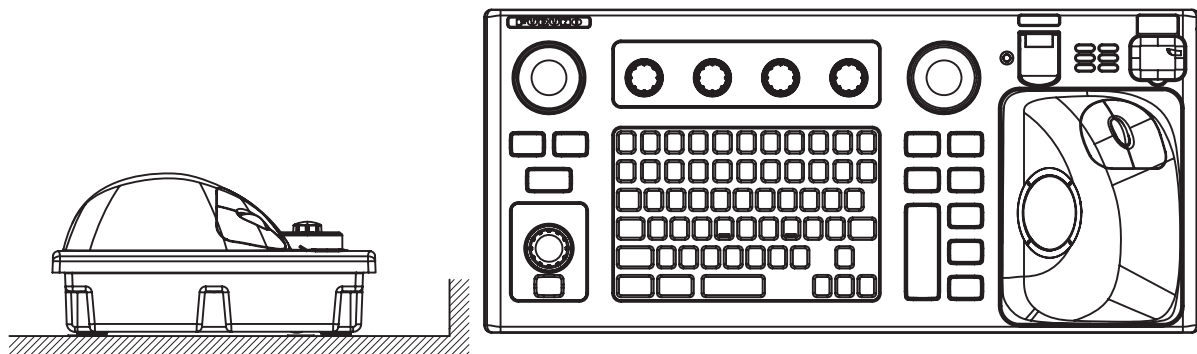
1. Fix the KB fixing metal to the bottom of the control unit.
2. Fix the unit with self-tapping screws (5x20, local supply).



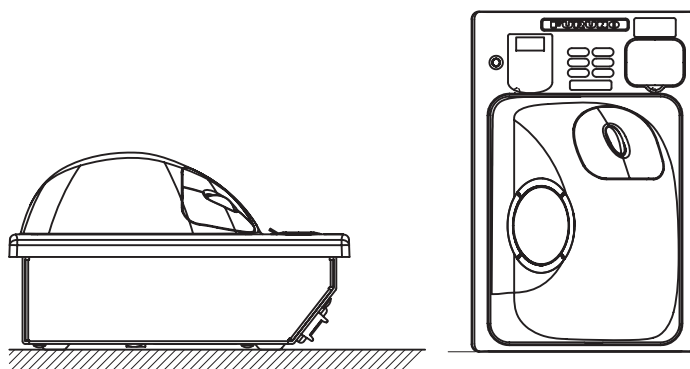
Side view of control units

Fixing without KB fixing metal

1. Drill four mounting holes of 5 mm (RCU-024) or 4 mm (RCU-026) diameter referring to the outline drawing at the back of this manual.
2. Fix the control unit with four screws (RCU-024: M4, RCU-026: M3) from under side of the desktop. (The M4 screws with a sufficient length for the thickness of the desktop should be provided locally.)



Control unit RCU-024



Control unit RCU-026

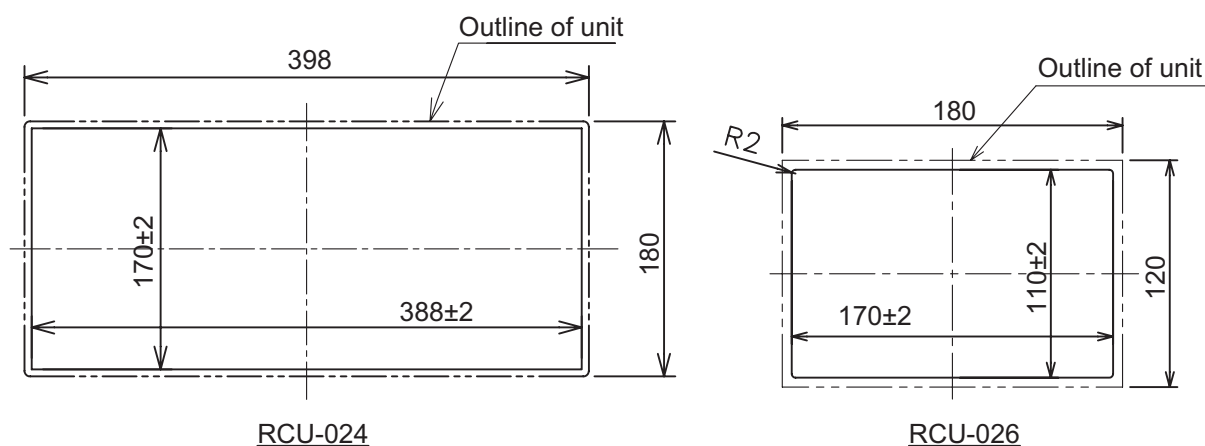
1.2.2 Flush mounting

Use the optional flush mount kit to mount the control unit in a console panel.

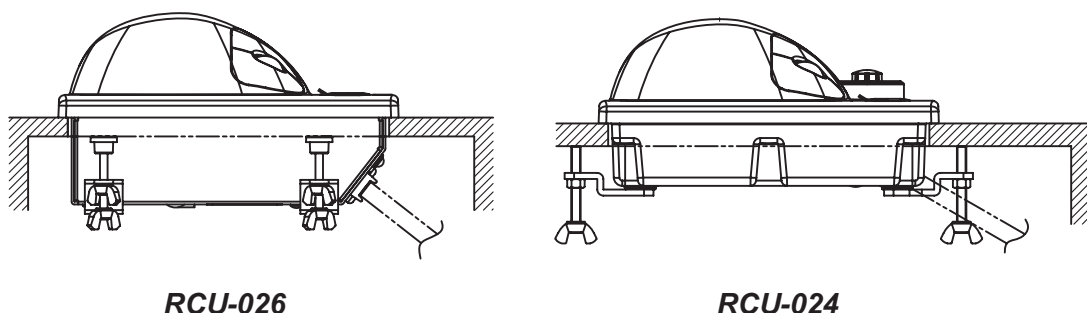
Flush mount kits for RCU-024/025

Control Unit	Type	Code No.
RCU-024	OP24-24	001-171-790
RCU-026	OP24-27	001-171-820

1. Prepare a cutout in the mounting location as shown on below.



2. Set the control unit to the cutout.
3. Attach the mounting plate to the control unit with four screws from the rear side.
4. Screw the wing screw to each mounting plate and then insert hex. bolt to each wing screw.
5. Fasten each wing screw and then fasten the wing nuts as shown in figure below.



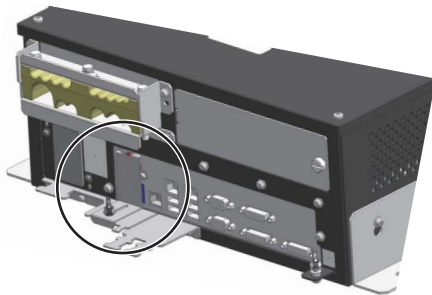
Side view of control units

1.3 Processor Unit

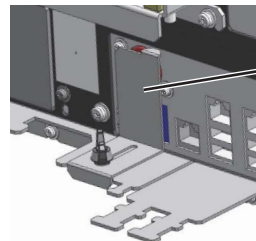
1.3.1 Mounting considerations

When you select a mounting location, keep in mind the following points:

- Locate the processor unit away from heat sources because of heat that can build up inside the cabinet.
- The vibration at the mounting location should be minimum.
- Locate the equipment away from places subject to water splash and rain.
- Make the service clearance of 100 mm in front of the vent hole (left side).
- Leave sufficient space at the sides and rear of the unit to facilitate maintenance.
- Make sure that the ground wire is connected between the earth terminal on the chassis and the ship's earth.
- A magnetic compass will be affected if the processor unit is placed too close to the magnetic compass. Observe the compass safe distances on page ii to prevent compass malfunction.
- Do not remove the dummy plate to prevent the wrong operation of the power switch. The items behind the plate are for use by the serviceman.

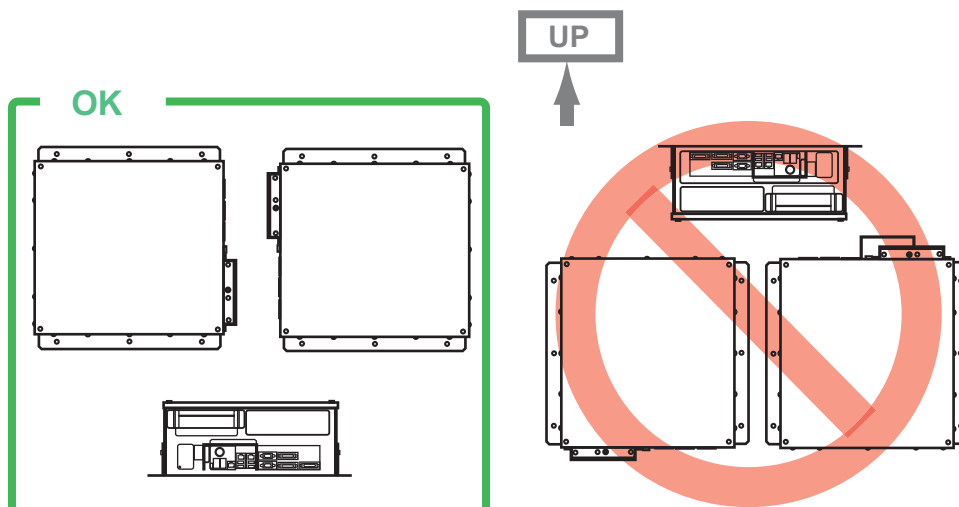


Processor unit, front view



keep the dummy plate in this position.

- Mount the processor unit on the floor, or on a bulkhead with the following direction (horizontal), because of the DVD drive unit.

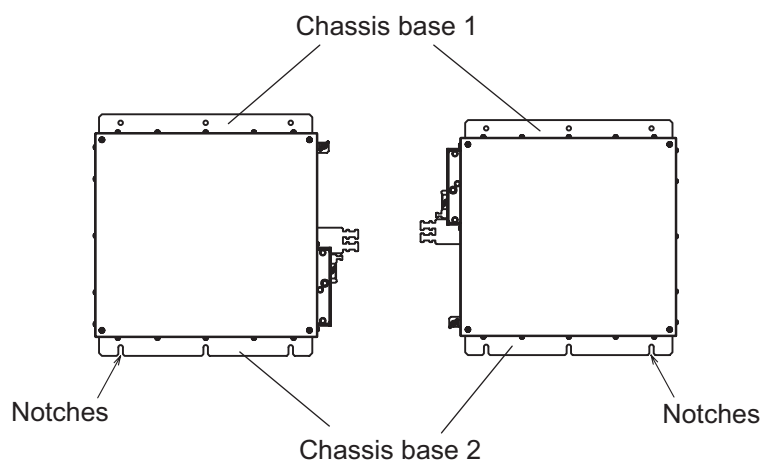


1.3.2 How to mount the processor unit

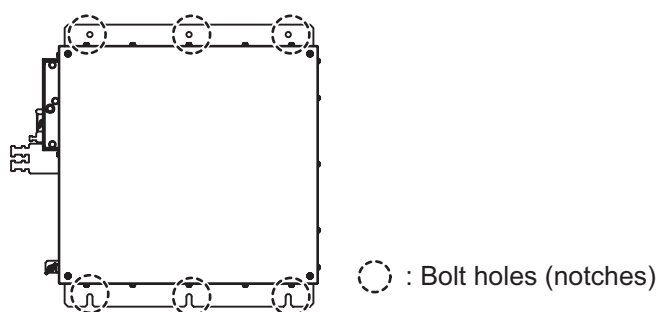
Use six bolts (M6, local supply) to mount the processor unit.

1. Use 10 binding head screws (M4x8, supplied) to attach the chassis bases 1 and 2 to the processor unit.

Note: For bulkhead mounting, attach the chassis base 2 so that the notches on it are facing the deck.



2. Use six bolts (M6, local supply) to fix the processor unit.



1.4 Sensor Adapter MC-3000S/3010A/3020D/3030D (option)

Mounting considerations

When you select a mounting location, keep in mind the following points:

- Locate the adapter away from heat sources because of heat that can build up inside the cabinet.
- The vibration should be minimal.
- Locate the equipment away from places subject to water splash and rain.
- Make sure that the ground wire is connected between the earth terminal on chassis and the ship's earth.
- Leave sufficient space at the sides and rear of the unit to facilitate maintenance.
- A magnetic compass will be affected if the adapter is placed too close to the magnetic compass. Observe the compass safe distances at the front of this manual to prevent interference to a magnetic compass.
- Select the mounting location considering the numbers of the sensor adapters connected.

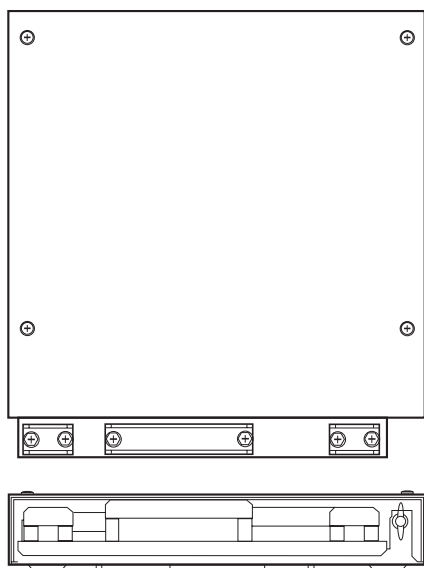
Maximum eight MC-3000S can be connected to a sensor network (for the redundant connection:16).

Maximum 10 sensor adapters (MC-3010A/3020D/3030D) can be connected to a MC-3000S. However, note that five MC-3010A can be connected.

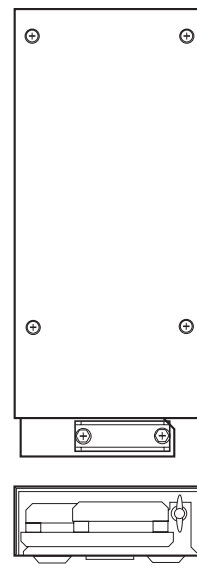
- Select the mounting location so that the length of cables among the sensor adapters (MC-3000S, 3010A, 3020D and 3030D) is less than 6 m. If the length is more than 6 m, the equipment may not work properly.

How to mount the sensor adapter

1. Unfasten four binding screws to remove the cover from the sensor adapter.
2. Fasten four self-tapping screws (4x20, supplied) to fix the sensor adapter.
3. Reattach the cover.



MC-3000S



MC-3010A/3020D/3030D

1.5 Intelligent Hub HUB-3000 (option)

Use the optional Intelligent Hub HUB-3000 to connect gateway network equipment. This network cannot be connected with the LAN network on board. Note that a commercial PC cannot be connected in this network, other than for the maintenance.

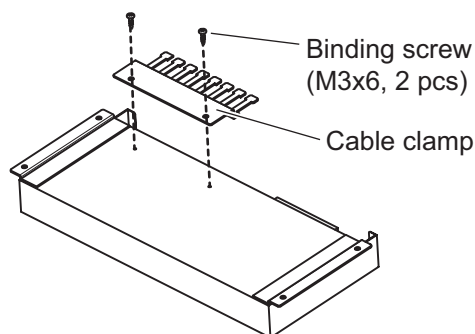
Mounting considerations

When you select a mounting location, keep in mind the following points:

- Locate the adapter away from heat sources because of heat that can build up inside the cabinet.
- The vibration should be minimal.
- Locate the equipment away from places subject to water splash and rain.
- Make sure that the ground wire is connected between the earth terminal on chassis and the ship's earth.
- Leave sufficient space at the sides and rear of the unit to facilitate maintenance.
- A magnetic compass will be affected if the adapter is placed too close to the magnetic compass. Observe the compass safe distances at the front of this manual to prevent interference to a magnetic compass.

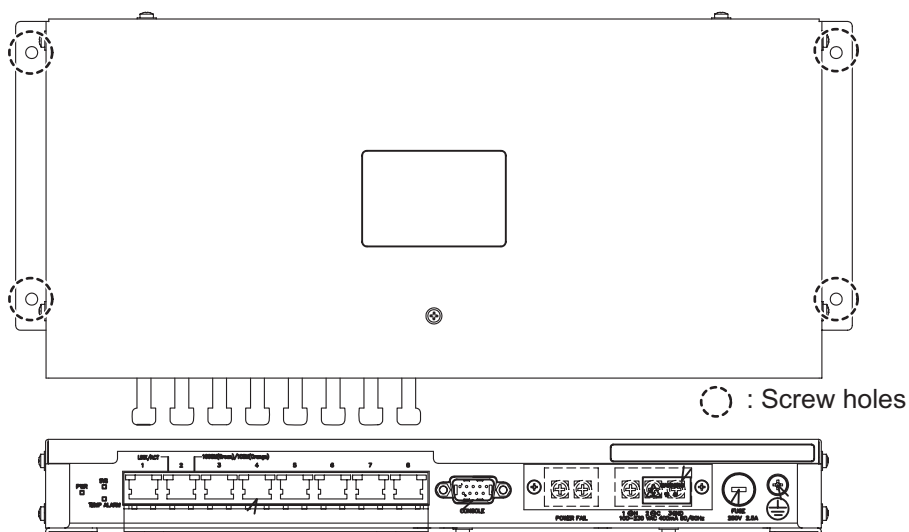
How to mount the intelligent hub HUB-3000

1. Use two binding screws (M3x6, supplied) to attach the cable clamp (supplied) to the bottom of the HUB-3000.



HUB-3000, bottom view

2. Fasten four self-tapping screws (4x20, supplied) to fix the unit.



○ : Screw holes

1.6 Switching HUB HUB-100 (option)

Use the optional Switching HUB HUB-100 to connect sensor networks. This network cannot be connected with the LAN network on board. Note that a commercial PC cannot be connected in this network, other than for the maintenance. The total length of all cables connected to the hub is 6 m.

For the mounting procedures, see the operator's manual for HUB-100 (Pub. No.OMC-35191).

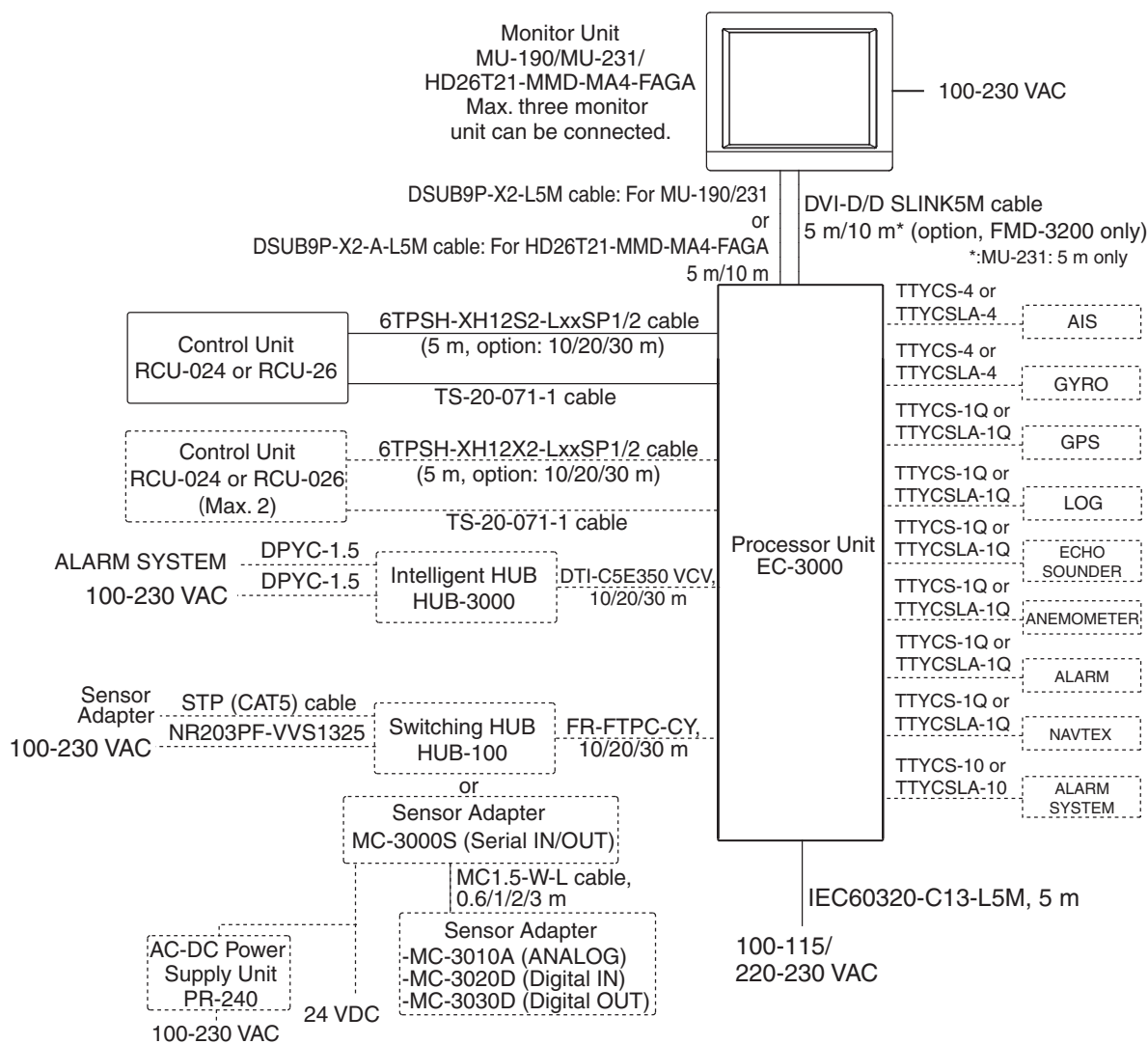
Mounting considerations

When you select a mounting location, keep in mind the following points:

- Locate the adapter away from heat sources because of heat that can build up inside the cabinet.
- The vibration should be minimal.
- Locate the equipment away from places subject to water splash and rain.
- Make sure that the ground wire is connected between the earth terminal on chassis and the ship's earth.
- Leave sufficient space at the sides and rear of the unit to facilitate maintenance.
- A magnetic compass will be affected if the adapter is placed too close to the magnetic compass. Observe the compass safe distances at the front of this manual to prevent compass malfunctions.

2. WIRING

The illustration on this page shows the general connection between FMD-3200/3300 and external equipment. For detailed information, see the interconnection diagram. Many of the cables mentioned are JIS (Japan Industry Standard) cables. If not available locally, use the equivalent. See the cable guide in the Appendix for how to select equivalent cables. For wiring information for the monitor unit MU-190/231, see the applicable operator's manual.



Note: The following monitors are available with the FMD-3200-BB. For the cable between the monitor other than MU-190/MU-231 and processor unit, use the cable assy. (type: DSUB9P-X2-A-L5M/10M).

Maker	Model	Maker	Model
FURUNO	MU-190	Hatteland	JH23T12FUD
	MU-231		JH23T14FUD
	MU-201CE		HD24T21MMD
	MU-231CE		JH26T11MMD
Hatteland	JH19T14FUD		HD26T21MMD
	JH20T17FUD		

Notice for the network construction

- Use the optional Switching Hub HUB-100 to connect the sensor networks. For the gateway networks, use the optional Intelligent Hub HUB-3000.
- Do not connect the LAN network on board to the above optional HUBs. Also, commercial PCs cannot be connected to the gateway network, other than for maintenance.
- To connect the FEA-2xx7 or FAR-2xx7 series via LAN network, use the gateway network.

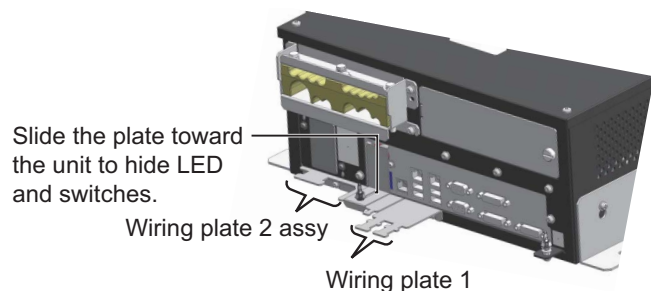
Notice on wiring

- Use the optional USB cable (type: OP24-32) to connect to USB port on the control unit.
- The length of the USB cable should be within 5 m to prevent equipment trouble.
- The length of LAN cables should be within 50 m.
- Use the CAT5E or CAT6 LAN cables for the network if available locally.
- If LAN cables are not available locally, use the optional LAN cables (FR-FTPC-CY for sensor network, DTI-C5E350 VCV for gateway network).
- If extension or division of the DVI or ERGB cables is necessary, use the dividers shown below.
 - DVI cable divider: DVI-12A (maker: INAGICS)
 - RGB divider: CIF-12H, DD-106 or WBD-14F (maker: INAGENICS)
- Make sure that the ground wires are connected between the ground terminals on each equipment and the ship's earth.
- If a UPS (user supply) is connected to this equipment, be sure that the grounding lamp does not light.

2.1 Processor Unit

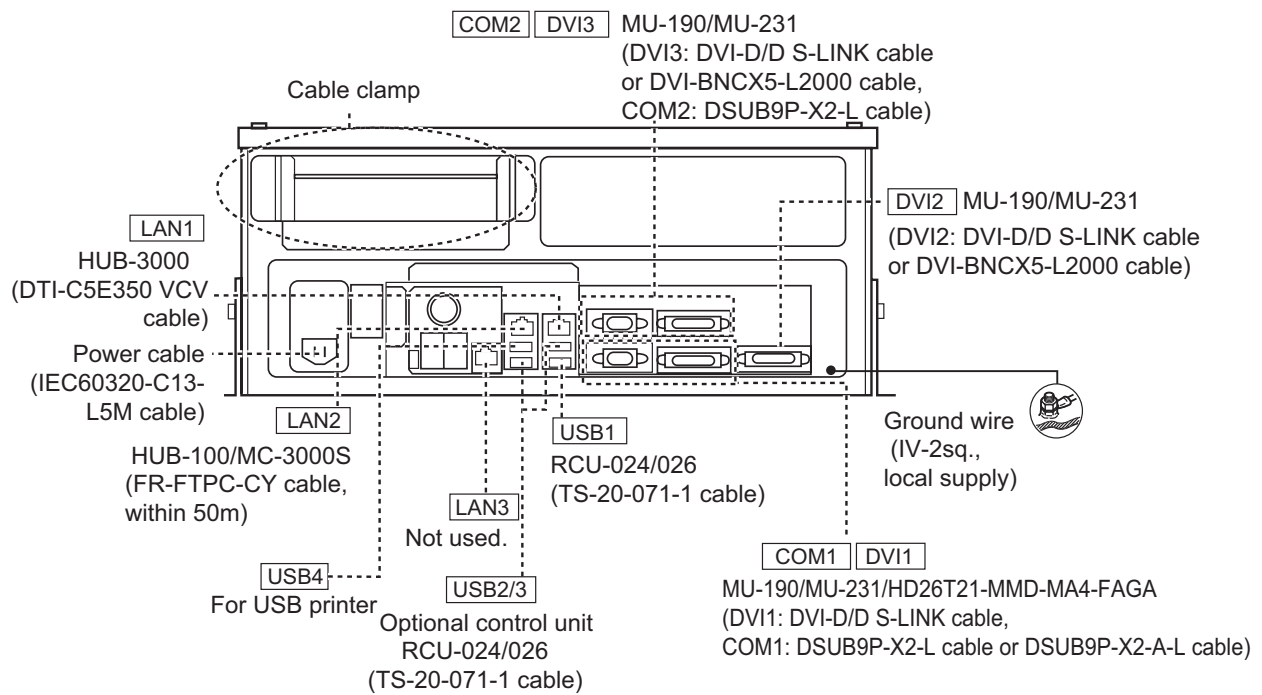
2.1.1 How to connect cables to terminals on the processor unit

Use screws (M3x6, supplied) to attach the wiring plate 1 and wiring plate 2 assy to the processor unit. Connect the cables shown below to the connectors at the front of the processor unit. After the connection, bind cables to the appropriate fixing metal with the cable ties (supplied).



For the cables from the monitor unit (type: DVI-D/D SLINK5M/10M (MU-190 only), DSUB9P-X2-L5/10M) and ground wire, connect them to the processor unit directly (without fixing to a wiring plate). Tighten the fixing screws on these connectors to prevent disconnection from the processor unit.

Note: Connect the cables so that they do not interfere with the opening or closing of the DVD tray.



Cables connected at the wiring plate 1

- USB cables from the control units
- Printer cable
- LAN cable (type: DTI-C5E350 VCV) from the HUB-3000
- LAN cable (type: FR-FTPC-CY) from the HUB-100/MC-3000S

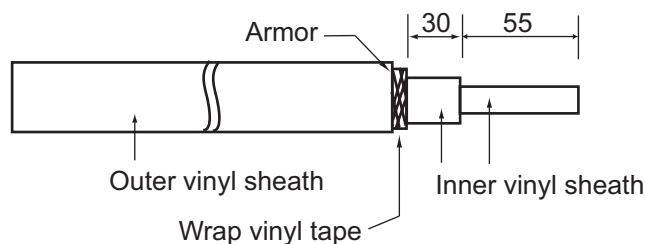
Cables connected at wiring plate 2 assy

- Power cable (Type: IEC60320-C13-L5M)
- LAN cable to the LAN3 port

2. WIRING

Fabricating LAN cable

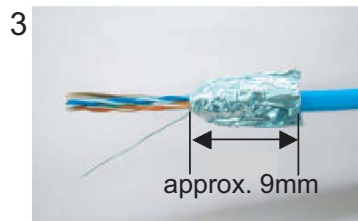
Fabricate the LAN cable (FR-FTPC-CY, DTI-C5E350 VCV), as shown below. (Wrap both edges of the armor with vinyl tape.) Confirm that the shield of the cable touches to the shell of the modular plug.



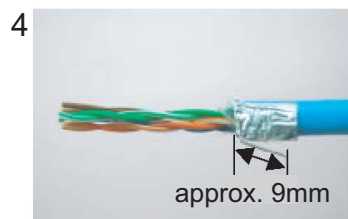
Expose inner vinyl sheath.



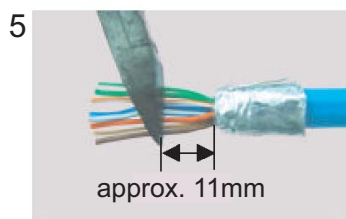
Remove the outer sheath by approx 25 mm. Be careful not to damage inner shield and cores.



Fold back the shield, wrap it onto the outer sheath and cut it, leaving 9 mm.



Fold back drain wire and cut it, leaving 9 mm.



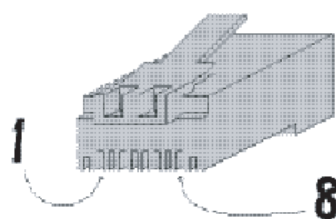
Straighten and flatten the core in order and cut them, leaving 11 mm.



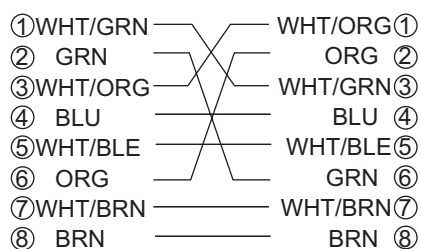
Insert the cable into the modular plug so that the folded part of the shield enters into the plug housing. The drain wire should be located on the tab side of the jack.



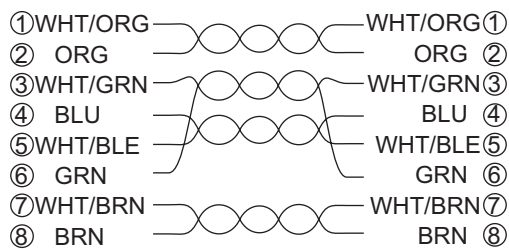
Using special crimping tool MPT5-8 (PANDUIT CORP.), crimp the modular plug. Finally check the plug visually.



[Cross cable]



[Straight cable]



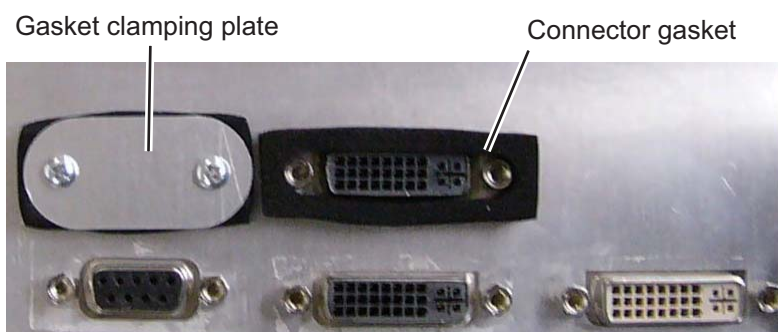
IPX2 kit

The optional IPX2 kit (Type: OP24-23, Code No.: 001-171-780) protects the connectors shown below to waterproofing standard IPX2.

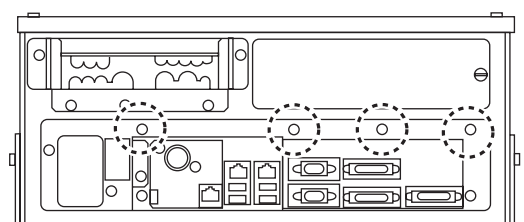
Contents of IPX2 kit

Name	Type	Code No.	Qty	Remarks
Binding Screw	#4-40UNCX3/16	000-176-619-10	10	
Connector Gasket 1	24-014-0107	100-367-730-10	2	For D-sub connectors
Connector Gasket 2	24-014-0108	100-367-741-10	3	For DVI connectors
Rainproof Cover	24-014-0109	100-372-202-10	1	
Gasket Clamping Plate	24-014-0114	100-372-210-10	2	For D-sub connectors
	24-014-0115	100-372-220-10	3	For DVI connectors

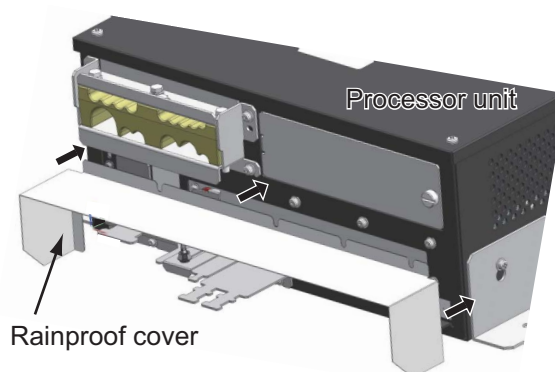
1. Set the connector gasket to the unused connector not used.
2. Fasten two binding screws to fix the connector gasket.



3. Peel the paper from the double-sided tape on the rainproof cover, then attach the cover to the position shown below by using four screws preattached to the processor unit.



Screws to fix the rainproof cover



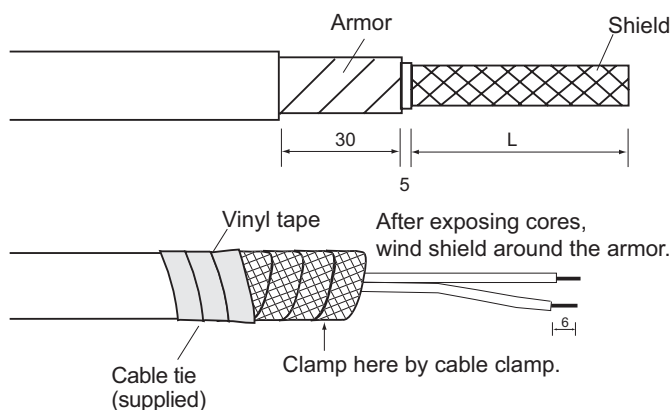
2.1.2 How to connect cables inside the processor unit

Fabrication

Fabricate JIS cables as shown below to connect them to the WAGO connectors on the I/O Board 24P0124 inside the processor unit.

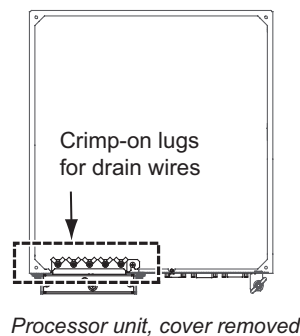
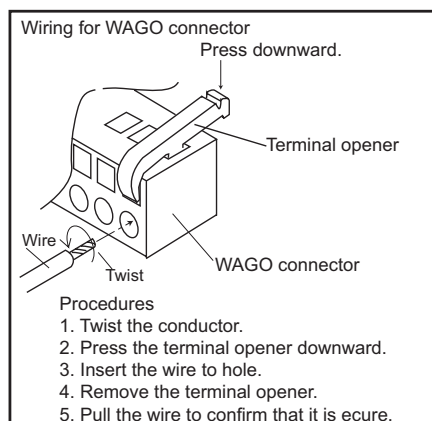
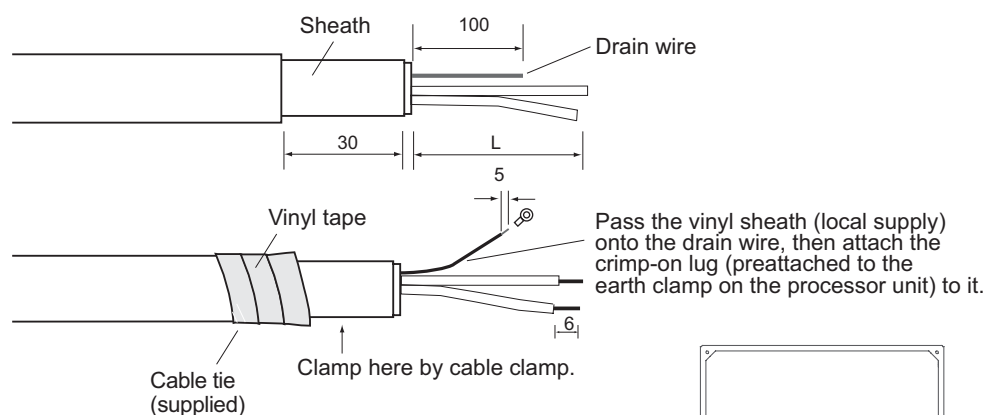
For locations of cables and cores, see the sticker on the reverse side of the top cover.
(All dimensions in millimeters)

Fabrication of TTYCS series



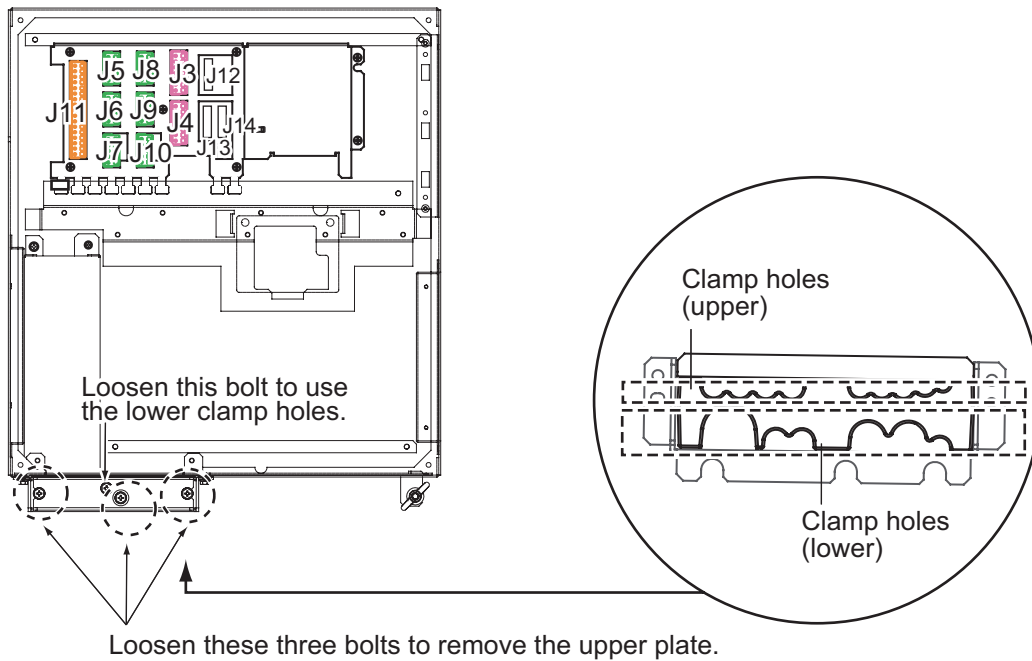
Cable type (JIS)	Length of "L"
TTYCS-4, TTYCSLA-4, TTYCS-1Q, TTYCSLA-1Q	400
TTYCS-10, TTYCSLA-10	380

Fabrication of TTYCSLA series



Connection

1. Unfasten four screws (M4x8) to remove the top cover from the processor unit.
2. Unfasten three bolts shown below to remove the upper plate of the cable clamp.

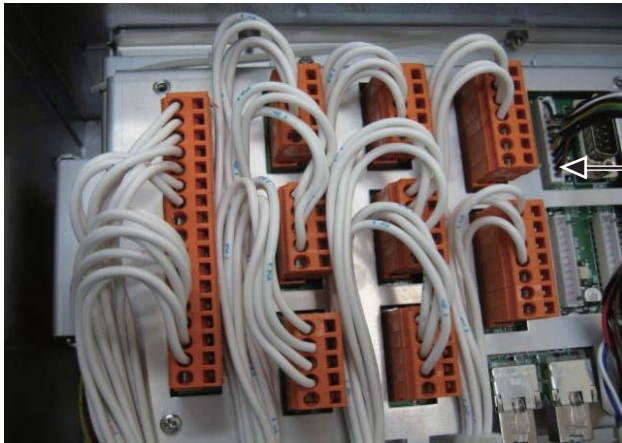
*Processor unit, top view*

3. Pass the cables through the clamp holes, then fasten the bolts removed at step 2 to fix the cables.



2. WIRING

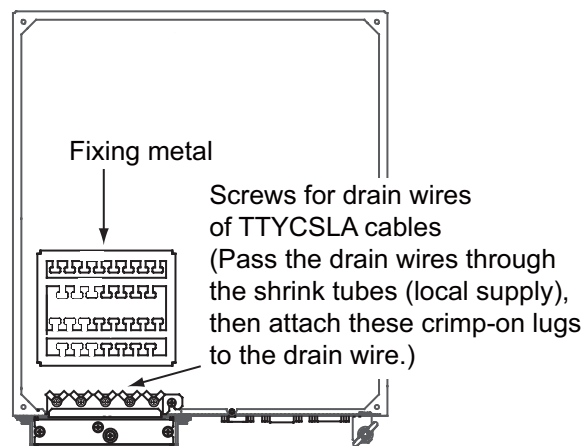
4. Connect the WAGO connectors appropriately to the I/O Board, referring to the interconnection diagram.



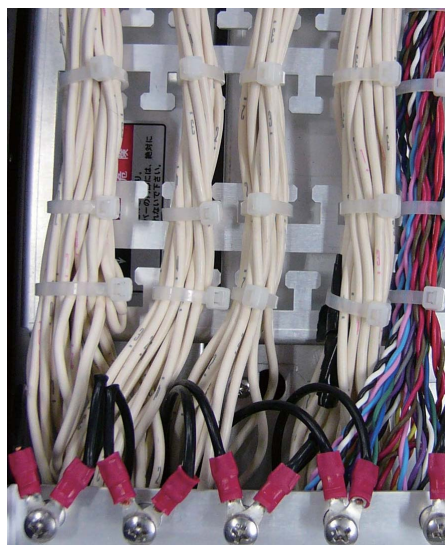
J12 (main control unit)

For J13 and J14 (sub control units), see the figure at step 2 on the previous page.

5. Bind the cables to the fixing metal in the processor unit with the cable ties (supplied).



6. For TTYCSLA series cables, pass the drain wire into the shrink tube (local supply), then fasten crimp-on lugs at the end of drain wires to screws shown above.



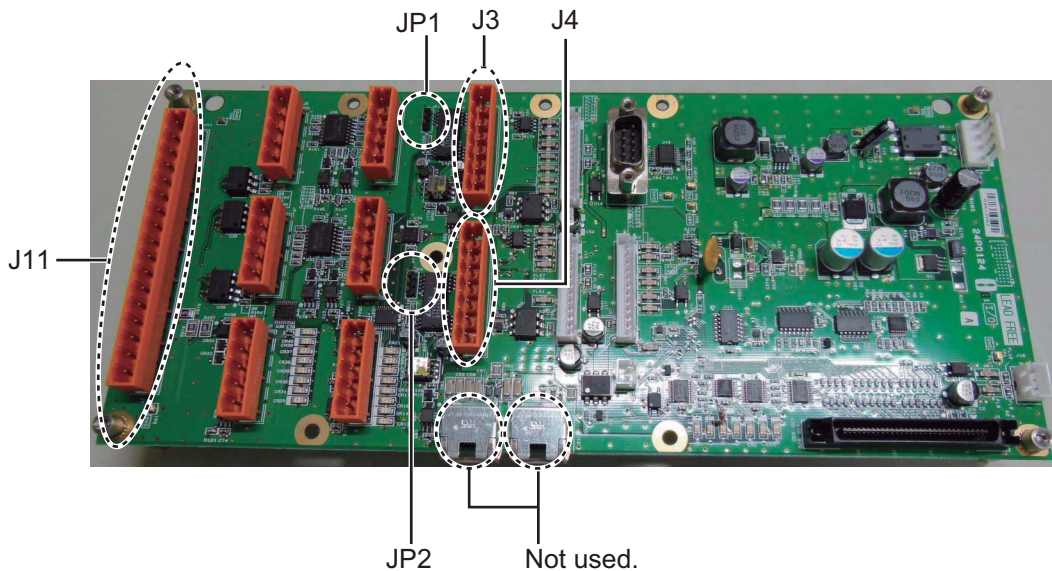
Example of wiring (inside the processor unit)

2.1.3 How to set jumper blocks on I/O Board

How to set the termination resistors

Use the jumper blocks JP1 and JP2 on the I/O Board (24P0124) to set the termination resistor J3 and J4 on or off. The default setting is termination resistor: on.

- When setting the starting/ending terminal for the multipoint connection, or multipoint is not connected (CH1 or CH2): termination resistor ON
- When not setting the starting/ending terminal for the multipoint connection (CH1 or CH2): termination resistor OFF



Processor unit, I/O Board (24P0124)

Jumper block J1		Connector J3
1-2	SHORT	Termination resistor: ON (default setting)
2-3	OPEN	
1-2	OPEN	Termination connector: OFF
2-3	SHORT	

Jumper block J2		Connector J4
1-2	SHORT	Termination resistor: ON (default setting)
2-3	OPEN	
1-2	OPEN	Termination connector: OFF
2-3	SHORT	

2. WIRING

How to select the serial input/output format

Use the connectors J3 and J4 to set the input/output format for serial CH1/CH2, from IEC-61162-1 or IEC-61162-2. For connectors J5 to J10, use TTYCS-1Q or TTYCSLA-1Q cable for a connector.

Connector J3

Pin #	Signal	In/Out	Description	IEC61162-2	IEC61162-1
1	TD1-A	Out	Serial CH1, output IEC61162-1/2	TTYCS(LA)-4	TTYCS(LA)-4
2	TD1-B	Out	Serial CH1, output IEC61162-1/2		
3	RD1-A	In	Serial CH1, input IEC61162-2		
4	RD1-B	In	Serial CH1, input IEC61162-2		
5	ISOGND1	-	Isolation GND (CH1)		
6	RD1-H	In	Serial CH1, input IEC61162-1	No connection	TTYCS(LA)-4
7	RD1-C	In	Serial CH1, input IEC61162-1		

Connector J4

Pin #	Signal	In/Out	Description	IEC61162-2	IEC61162-1
1	TD2-A	Out	Serial CH2, output IEC61162-1/2	TTYCS(LA)-4	TTYCS(LA)-4
2	TD2-B	Out	Serial CH2, output IEC61162-1/2		
3	RD2-A	In	Serial CH2, input IEC61162-2		
4	RD2-B	In	Serial CH2, input IEC61162-2		
5	ISOGND2	-	Isolation GND (CH2)		
6	RD2-H	In	Serial CH2, input IEC61162-1	No connection	TTYCS(LA)-4
7	RD2-C	In	Serial CH2, input IEC61162-1		

Connector J5

Pin#	Signal	In/Out	Description	Remarks
1	TD3-A	Out	Serial CH3, output IEC61162-1	Use TTYCS(LA)-1Q, IREC61162-1 only
2	TD3-B	Out	Serial CH3, output IEC61162-1	
3	RD3-H	In	Serial CH3, input IEC61162-1	
4	RD3-C	In	Serial CH3, input IEC61162-1	
5	GND	-	GND	

Connector J6

Pin#	Signal	In/Out	Description	Remarks
1	TD4-A	Out	Serial CH4, output IEC61162-1	Use TTYCS(LA)-1Q, IREC61162-1 only
2	TD4-B	Out	Serial CH4, output IEC61162-1	
3	RD4-H	In	Serial CH4, input IEC61162-1	
4	RD4-C	In	Serial CH4, input IEC61162-1	
5	GND	-	GND	

Connector J7

Pin#	Signal	In/Out	Description	Remarks
1	TD5-A	Out	Serial CH5, output IEC61162-1	Use TTYCS(LA)-1Q, IREC61162-1 only
2	TD5-B	Out	Serial CH5, output IEC61162-1	
3	RD5-H	In	Serial CH5, input IEC61162-1	
4	RD5-C	In	Serial CH5, input IEC61162-1	
5	GND	-	GND	

Connector J8

Pin#	Signal	In/Out	Description	Remarks
1	TD6-A	Out	Serial CH6, output IEC61162-1	Use TTYCS(LA)-1Q, IREC61162-1 only
2	TD6-B	Out	Serial CH6, output IEC61162-1	
3	RD6-H	In	Serial CH6, input IEC61162-1	
4	RD6-C	In	Serial CH6, input IEC61162-1	
5	GND	-	GND	

Connector J9

Pin#	Signal	In/Out	Description	Remarks
1	TD7-A	Out	Serial CH7, output IEC61162-1	Use TTYCS(LA)-1Q, IREC61162-1 only
2	TD7-B	Out	Serial CH7, output IEC61162-1	
3	RD7-H	In	Serial CH7, input IEC61162-1	
4	RD7-C	In	Serial CH7, input IEC61162-1	
5	GND	-	GND	

Connector J10

Pin#	Signal	In/Out	Description	Remarks
1	TD8-A	Out	Serial CH8, output IEC61162-1	Use TTYCS(LA)-1Q, IREC61162-1 only
2	TD8-B	Out	Serial CH8, output IEC61162-1	
3	RD8-H	In	Serial CH8, input IEC61162-1	
4	RD8-C	In	Serial CH8, input IEC61162-1	
5	GND	-	GND	

How to set contact input/output

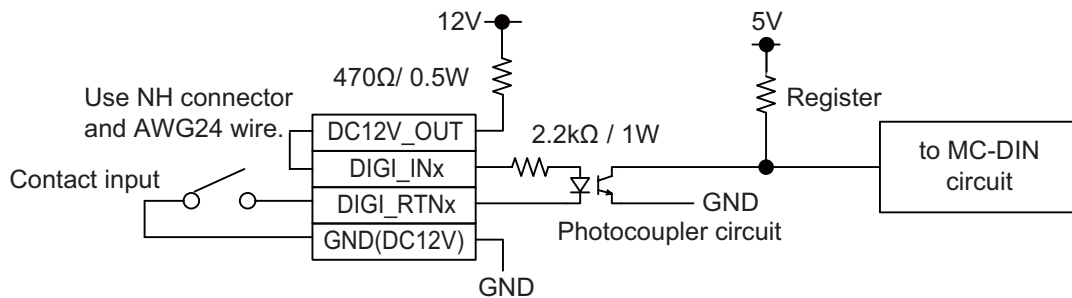
The connector J11 can be used for the connection of contact input or voltage input. Refer to the figures shown below to make the wiring which complies with the input specification.

Note: The input must not exceed the range of the input voltage, to prevent malfunction.

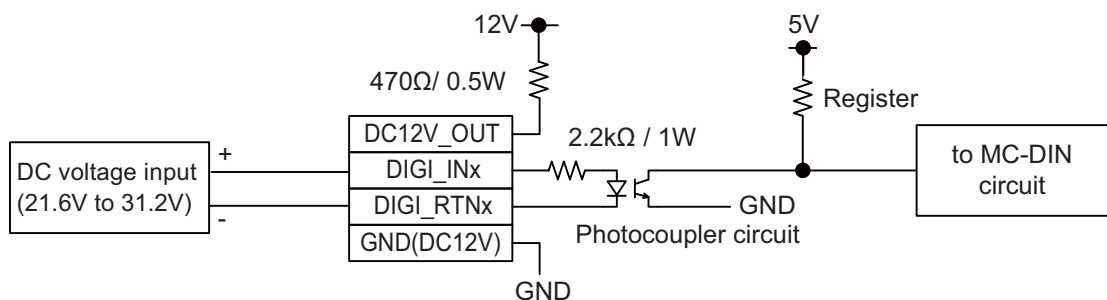
-Setting for voltage input: 21.6V to 31.2V

-Setting for contact input: Voltage cannot be input (contact signal only).

- (Setting for contact input)



- (Setting for voltage input)

**Connector J11**

Pin #	Signal name	In/Out	Description	Contact input	Voltage input
1	SYS_FAIL-A	Out	System fail output	TTYCS(LA)-10	TTYCS(LA)-10
2	SYS_FAIL-B	Out	System fail output		
3	PWR_FAIL-A	Out	Power fail output		
4	PWR_FAIL-B	Out	Power fail output		
5	NC1-A	Out	Alarm output (NC1)		
6	NC1-B	Out	Alarm output (NC1)		
7	NC2-A	Out	Alarm output (NC2)		
8	NC2-B	Out	Alarm output (NC2)		
9	NO1-A	Out	Alarm output (NO1)		
10	NO1-B	Out	Alarm output (NO1)		
11	NO2-A	Out	Alarm output (NO2)		
12	NO2-B	Out	Alarm output (NO2)		
13	DC12V_OUT	Out	ACK input	#13-#14: short	No connection
14	DIGI_IN1	In	ACK input		TTYCS(LA)-10
15	DIGI_RTN1	Out	ACK input	TTYCS(LA)-10	No connection
16	GND (DC12V)	In	ACK input		
17	GND	-	GND	NO connection	

Note: NC1/2 and NO1/2 are output with a fixed value.

2.2 Monitor Unit

For the wiring of the monitor unit, see the operator's manual supplied with the monitor unit.

Mounting consideration

(Standard type)

- Connect the ECDIS main monitor to the DVI1 and COM1 ports.
- For the sub ECDIS monitor, connect it to the DVI2 and COM2 port.

(Conning type)

- ECDIS main monitor: DVI1 and COM1 ports, conning monitor: DVI3 port and COM2 ports
- When an ECDIS sub monitor is added to the above connection, connect it to the DVI2 port (the brilliance adjustment is not available).

(Notice for HD26T21-MMD-MA4-FAGA)

- For the monitor unit HD26T21-MMD-MA4-FAGA, it is required to calibrate monitor color ([Monitor Color Calibration]) in the installation. To calibrate monitor color, contact your dealer. Also, use the supplied cable assy. (type: DSUB9P-X2-A-L5M/10M) to connect with the processor unit.

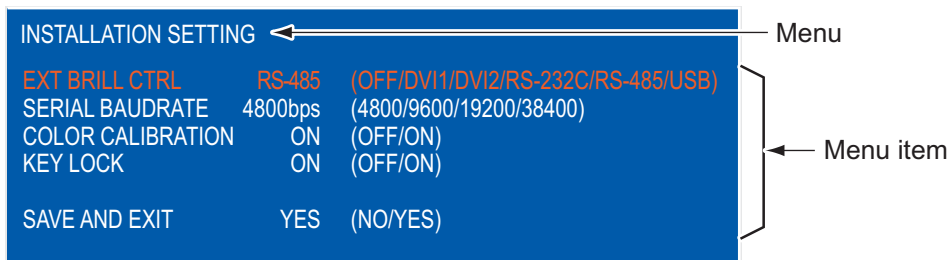
(VDR connection, ask your dealer)

To connect a VDR, it is necessary to output data in analog format. See the installation manuals for VDR to prepare the cables (BNCX5-DSUB15-Lxxx and 1.5C2V-3C2V-T) to use.

- When connecting a VDR to the DVI3 port::
Use the optional DVI-BNCX5-L2000 cable to output RGB signal from the DVI-I. Adjustment of the output picture is necessary.
- When connecting a VDR to the DVI2 port:
Use a DVI/RGB converter (maker: IMAGENICS, type: DVI-12A, local supply) to convert DVI output from DVI2 port to RGB.

Setting for MU-190/MU-231

The [INSTALLATION SETTING] menu appears only when the power is turned on for the first time after installation of the monitor unit.



Adjust the settings referring to the following table.

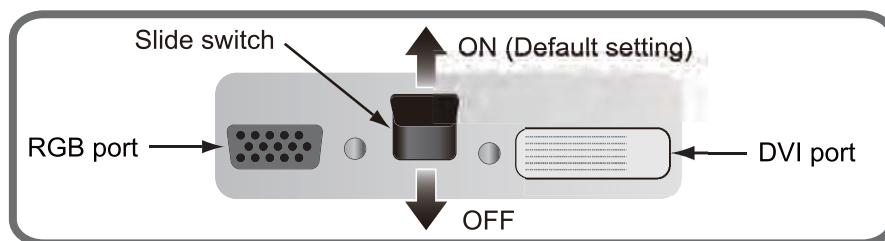
EXT BRILL CTRL	SERIAL BAUDRATE	COLOR CALIBRATION	KEY LOCK	DVI PWR SYNC*
RS-485	4800bps	ON	ON	YES

*: [DVI PWR SYNC] is the slide switch at the bottom rear of the monitor unit. Confirm that this switch is set to [ON] (default setting). See Slide switch below for details.

Slide switch

Set the slide switch to "ON" (default setting). This setting automatically powers the monitor unit on or off according to the DVI signal input. The power switch of the monitor unit is inoperative.

Note: The OFF position provides control of the monitor unit power with the power switch of the monitor unit.

**How to open the [INSTALLATION SETTING] menu**

Turn off the monitor unit. While you hold the DISP key, press the BRILL key to turn on the monitor unit. Press and hold the DISP key for more than five seconds.

Note: When the [DVI PWR SYNC] slide switch is ON, turn on the connected external equipment while you press the DISP key to turn on the monitor unit.

2.3 Sensor Adapters (option)

Maximum eight MC-3000S can be connected to a sensor network (for the redundant connection: 16). The MC-3000S (serial input/output, IEC61162-2/1, 4ch) can connect max. 10 sensor adapters using the MC1.5-W cables. The maximum number of MC-3010A units is five.

When fabricating the MC1.5-W cables, use the lot terminal (ferrule type, supplied) to maintain performance. This fabrication requires the optional crimping tool (type: CRIMPFOX 10S). For the relations between the connectors and rod terminals, see page AP-2. Also, the stickers attached on the reverse side of the covers show the detailed connections.

Attache the cables to the applicable pins.

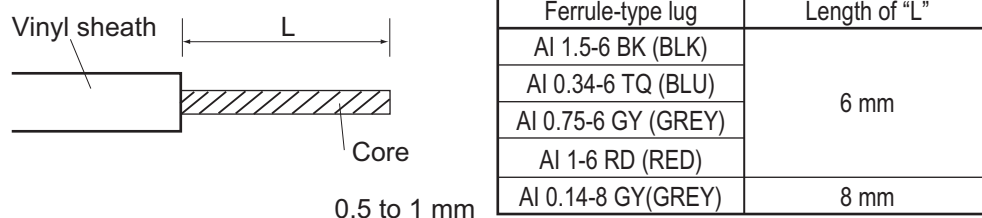
Pin No.	Cable color	Signal
1	Red	24V_OUT or 24V_IN
2	Black	24V_GND
3	White	MODBUS-A
4	Blue	MODBUS-B
5	Gray	GND

Use the ferrule-type terminals (supplied) to connect the cables to the terminals in the sensor adapters. This connection requires a crimping tool (CRIMPFOX10S, option).

Note 1: Use the MC1.5-W cable between the sensor adapters.

Note 2: The total length of the MC1.5-W cables should be less than 6 m to prevent malfunction.

How to attach ferrule-type lug



0.5 to 1 mm

Rod terminal (ferrule type):
The core must protrude 0.5 to 1 mm past the rod terminal.

Rod terminal (ferrule type):
After attaching the rod terminal, use the optional crimping tool CRIMPFOX 10S to crimp.

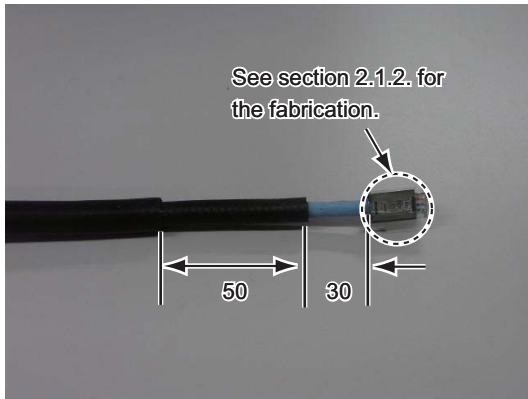
2. WIRING

2.3.1 MC-3000S

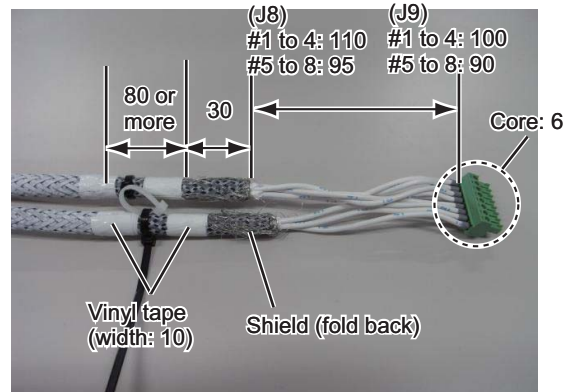
Use the LAN cable FR-FTPC-CY cable to connect the MC-3000S and the processor unit. With HUB-100, a maximum of eight MC-3000S can be connected.

Fabrications

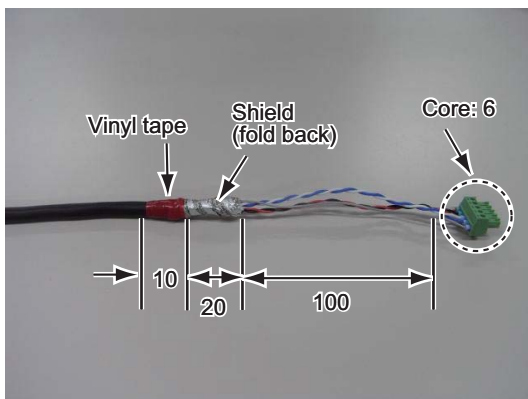
LAN cable (FR-FTPC-CY)



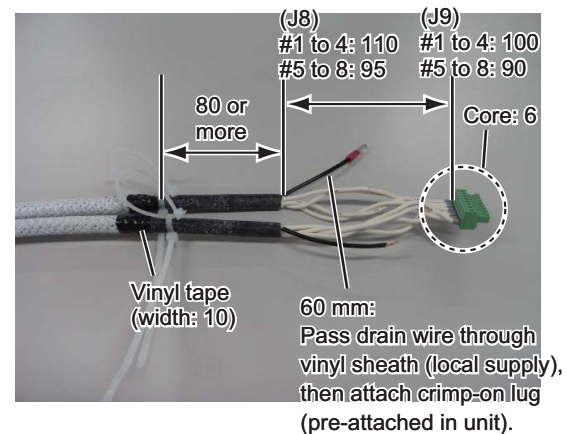
TTYCS-1Q cable

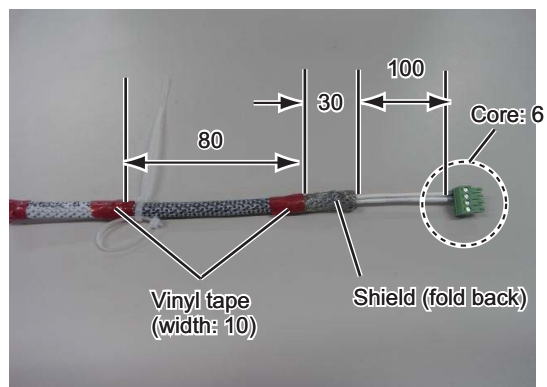
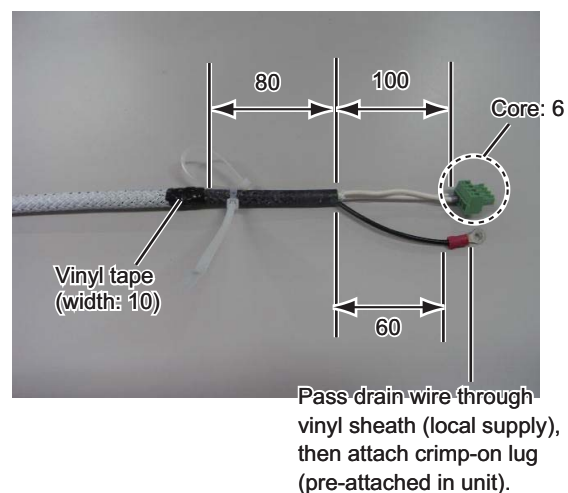
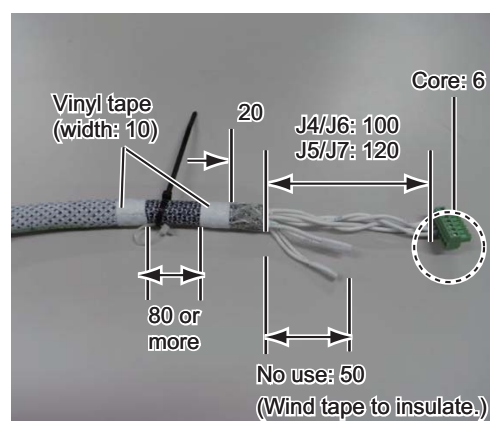
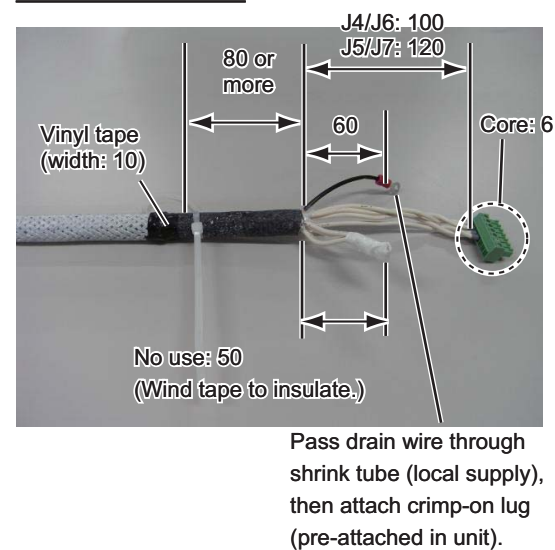
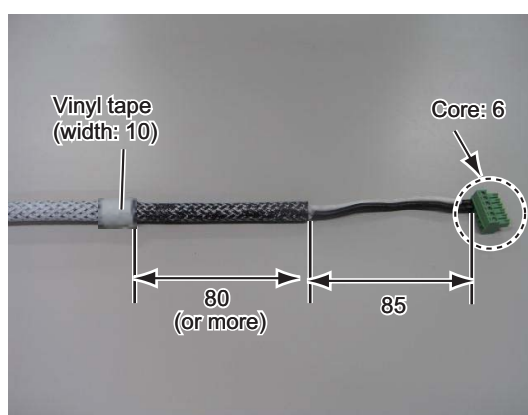


MC1.5-W-L600/1000/2000/3000 cable



TTYCSLA-1Q cable

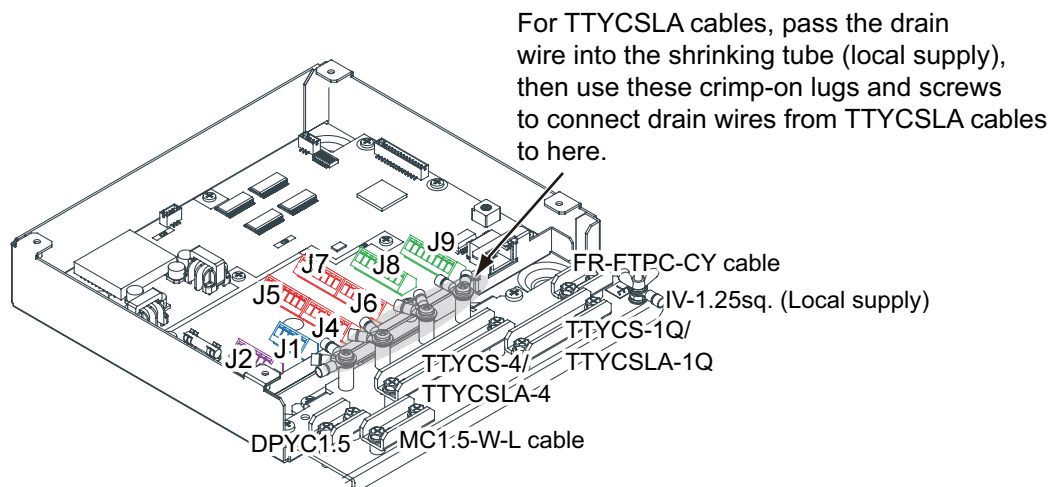


TTYCS-1 cableTTYCSLA-1 cableTTYCS-4 cableTTYCSLA-4 cableDPYC-1.5 cable

2. WIRING

Connections

Unfasten four screws to remove the cover, pass the cables through the clamps and attach the cables to respective connectors. The shield part of the cable (or drain wire) must be fastened by (connected to) the clamp.



Note: Fasten the cable shield with the cable clamp.

How to set NC/NO output (J2)

The POWER FAIL signal on the connector J2 can be set to NC (normal close) output or NO (normal open) output as shown in the table below.

Connector J2

Pin #	Signal name	In/Out	Description	NO	NC
1	24V_IN	-	24 VDC	DPYC-1.5	
2	24V_GND	-	GND (24 VDC)		
3	PWR_FAIL_A	Out	Power fail output	TTYCS(LA)-1	No connection
4	PWR_FAIL_COM	Out	Power fail output		TTYCS(LA)-1
5	PWR_FAIL_B	Out	Power fail output	No connection	

How to set input specification (J4 to J9)

For connectors J4 to J7, the connections are different depending on the input specifications as shown below.

Connector J4

Pin #	Signal name	In/Out	Description	IEC61162-2	IEC61162-1	Modbus*
1	TD1-A	Out	Serial CH1, output IEC61162-1/2/modbus	TTYCS(LA)-4	TTYCS(LA)-4	TTYCS(LA)-4
2	TD1-B	Out	Serial CH1, output IEC61162-1/2/modbus			
3	RD1-A	In	Serial CH1, input IEC61162-2/modbus			
4	RD1-B	In	Serial CH1, input IEC61162-2/modbus			
5	ISOGND1	-	Isolation, GND (CH1)			
6	RD1-H	In	Serial CH1, input IEC61162-1	No connection	TTYCS(LA)-4	
7	RD1-C	In	Serial CH1, input IEC61162-1			

*: Set the jumpers J20/J21 to Modbus.

Connector J5

Pin #	Signal name	In/Out	Description	IEC61162-2	IEC61162-1	Modbus*
1	TD2-A	Out	Serial CH2, output IEC61162-1/2/modbus	TTYCS(LA)-4	TTYCS(LA)-4	TTYCS(LA)-4
2	TD2-B	Out	Serial CH2, output IEC61162-1/2/modbus			
3	RD2-A	In	Serial CH2, input IEC61162-2/modbus			
4	RD2-B	In	Serial CH2, input IEC61162-2/modbus			
5	ISOGND2	-	Isolation, GND (CH2)			
6	RD2-H	In	Serial CH2, input IEC61162-1	No connection	TTYCS(LA)-4	
7	RD2-C	In	Serial CH2, input IEC61162-1			

*: Set the jumpers J20/J21 to Modbus.

2. WIRING

Connector J6

Pin #	Signal name	In/Out	Description	IEC61162-2	IEC61162-1
1	TD3-A	Out	Serial CH3, output IEC61162-1/2	TTYCS(LA)-4	TTYCS(LA)-4
2	TD3-B	Out	Serial CH3, output IEC61162-1/2		No connection
3	RD3-A	In	Serial CH3, input IEC61162-2		
4	RD3-B	In	Serial CH3, input IEC61162-2		
5	ISOGND3	-	Isolation, GND (CH3)		
6	RD3-H	In	Serial CH3, input IEC61162-1	No connection	TTYCS(LA)-4
7	RD3-C	In	Serial CH3, input IEC61162-1		

Connector J7

Pin #	Signal name	In/Out	Description	IEC61162-2	IEC61162-1
1	TD4-A	Out	Serial CH4, output IEC61162-1/2	TTYCS(LA)-4	TTYCS(LA)-4
2	TD4-B	Out	Serial CH4, output IEC61162-1/2		No connection
3	RD4-A	In	Serial CH4, input IEC61162-2		
4	RD4-B	In	Serial CH4, input IEC61162-2		
5	ISOGND4	-	Isolation, GND (CH4)		
6	RD4-H	In	Serial CH4, input IEC61162-1	No connection	TTYCS(LA)-4
7	RD4-C	In	Serial CH4, input IEC61162-1		

Connector J8

Pin#	Signal name	In/Out	Description	Used cable
1	TD5-A	Out	Serial CH5, output IEC61162-1	TTYCS-1Q or TTYCSLA-1Q
2	TD5-B	Out	Serial CH5, output IEC61162-1	
3	RD5-H	In	Serial CH5, input IEC61162-1	
4	RD5-C	In	Serial CH5, input IEC61162-1	
5	TD6-A	Out	Serial CH6, output IEC61162-1	
6	TD6-B	Out	Serial CH6, output IEC61162-1	
7	RD6-H	In	Serial CH6, input IEC61162-1	
8	RD6-C	In	Serial CH6, input IEC61162-1	

Connector J9

Pin#	Signal name	In/Out	Description	Used cable
1	TD7-A	Out	Serial CH7, output IEC61162-1	TTYCS-1Q or TTYCSLA-1Q
2	TD7-B	Out	Serial CH7, output IEC61162-1	
3	RD7-H	In	Serial CH7, input IEC61162-1	
4	RD7-C	In	Serial CH7, input IEC61162-1	
5	TD8-A	Out	Serial CH8, output IEC61162-1	
6	TD8-B	Out	Serial CH8, output IEC61162-1	
7	RD8-H	In	Serial CH8, input IEC61162-1	
8	RD8-C	In	Serial CH8, input IEC61162-1	

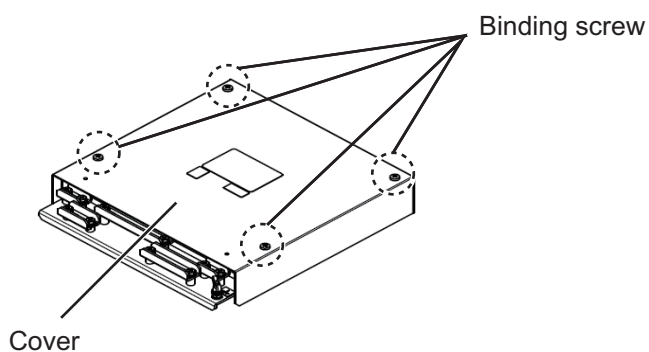
Case packing OP24-28

The optional kit OP24-28 protects the connectors on the MC-3000S to waterproofing standard IPX2.

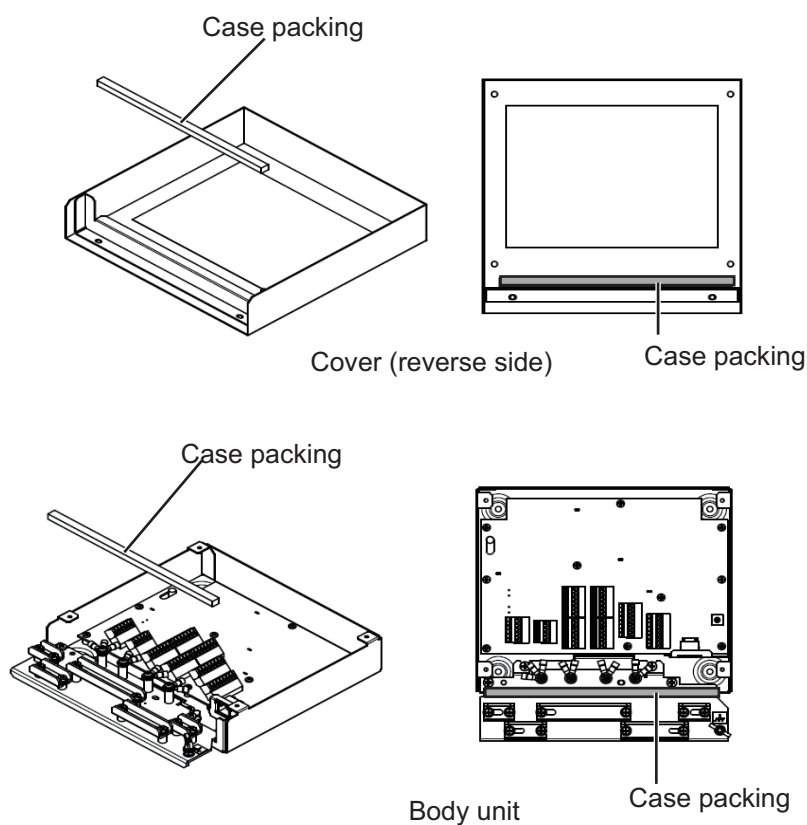
Case packing (type: OP24-28, code no.: 001-169-970)

Name	Type	Code No.	Qty	Remarks
Case packing (serial)	21-014-2051	100-367-880-10	2	For MC-3000S

1. Unfasten four binding screws to remove the cover from the adapter.



2. Peel the paper from the case packing, then attach the case packing to the reverse side of the cover and the body unit as shown below.



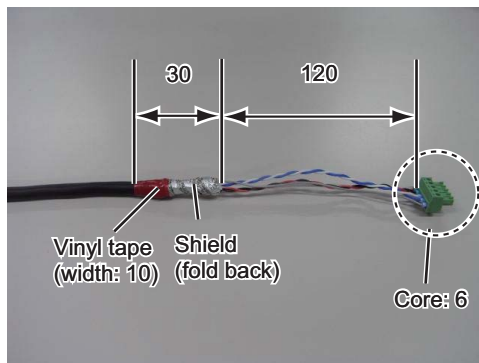
3. Attach the cover to the MC-3000S body unit.

2.3.2 MC-3010A/3020D/3030D

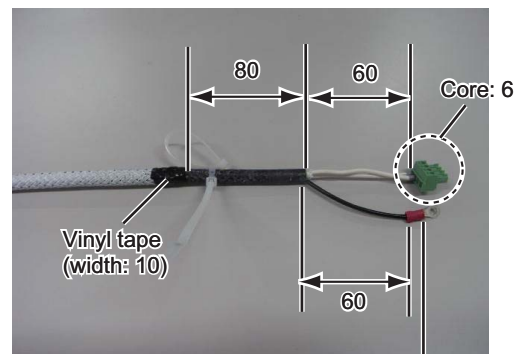
- MC-3010A: Inputs analog signal. To set MC-3010A to the current input, connect short pins to each terminals.
- MC-3020D: Inputs digital signal (8ch contact input). Contact or voltage input is selectable (contact input requires short pins).
- MC-3030D: Outputs digital signal (8ch, normal open/close).

Fabrications

MC1.5-W-L600/1000/2000/3000 cable
(Input)

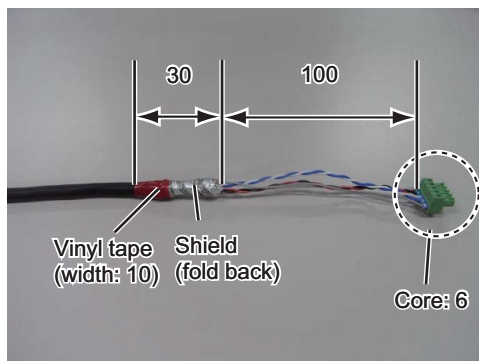


TTYCSLA-1 (MC-3010A)

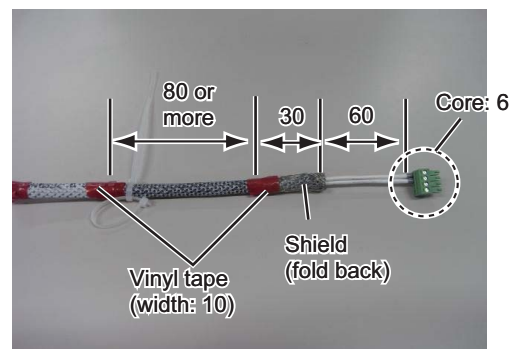


Pass drain wire through shrink tube (local supply), then attach crimp-on lug (pre-attached in unit).

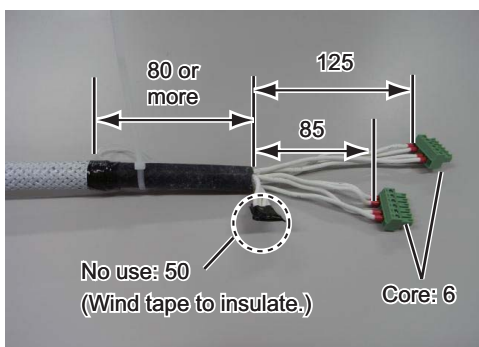
MC1.5-W-L600/1000/2000/3000 cable
(Output)



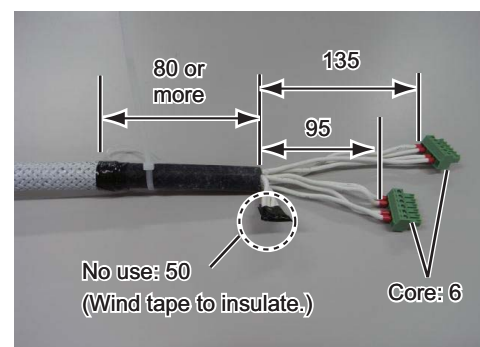
TTYCS-1 (MC-3010A)

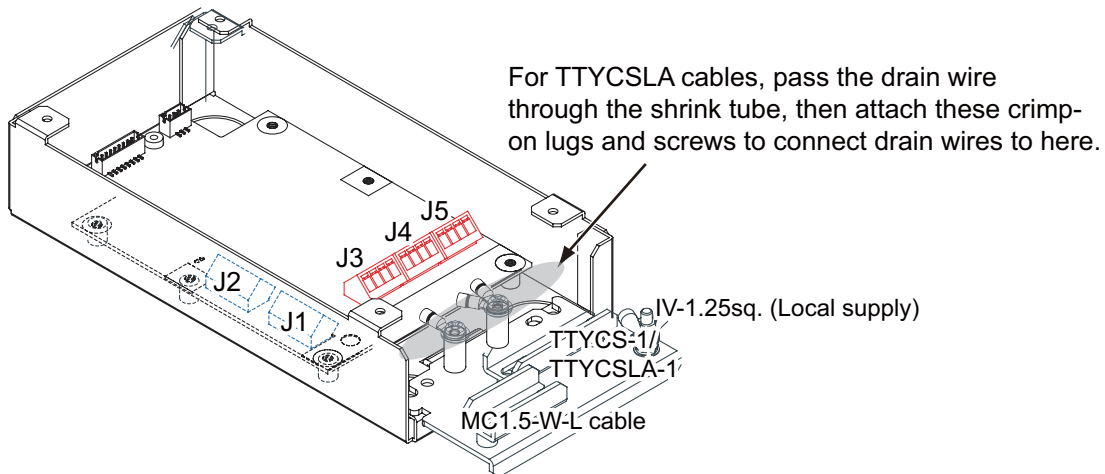


MPYC-12 cable (MC-3030D)

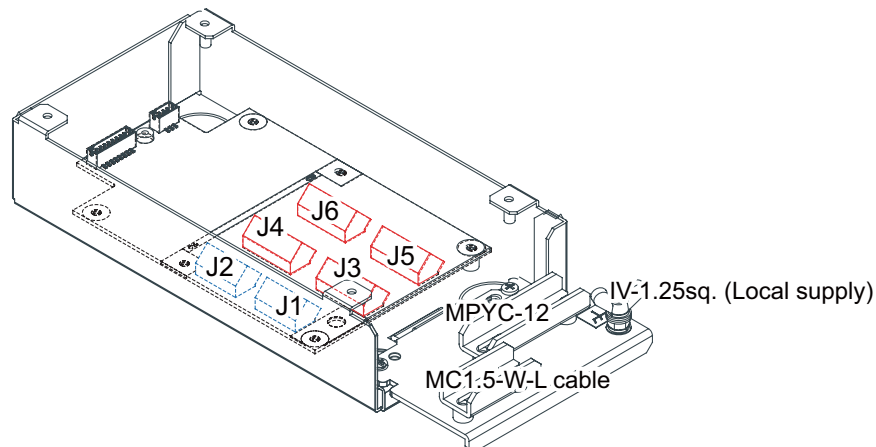


MPYC-12 cable (MC-3020D)



Connection

Note: Fasten the cable shield with the cable clamp.



Note: Fasten the cable shield with the cable clamp.

MC-3020D/3030D

Input method (MC-3010A only)

Select the method of the analog data input, power voltage or power current.

Note 1: The input must not exceed the range of the input voltage, to prevent malfunction.

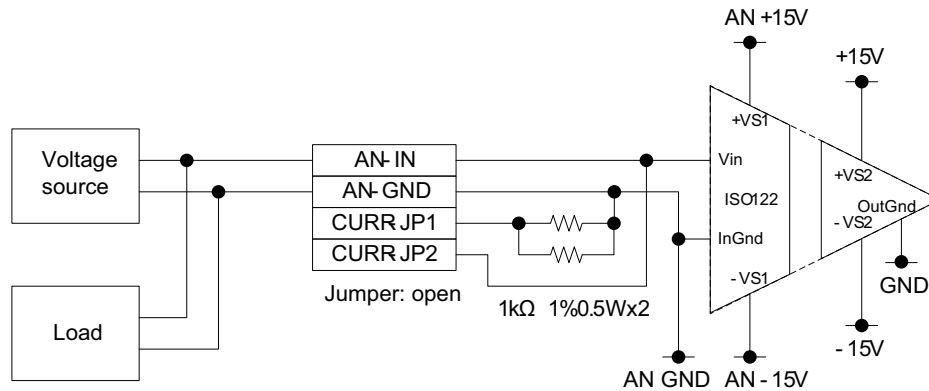
-Setting for voltage input: -10V to +10V or 0 to 10V (depending on the setting)

-Setting for contact input: Voltage 4mA to 20mA.

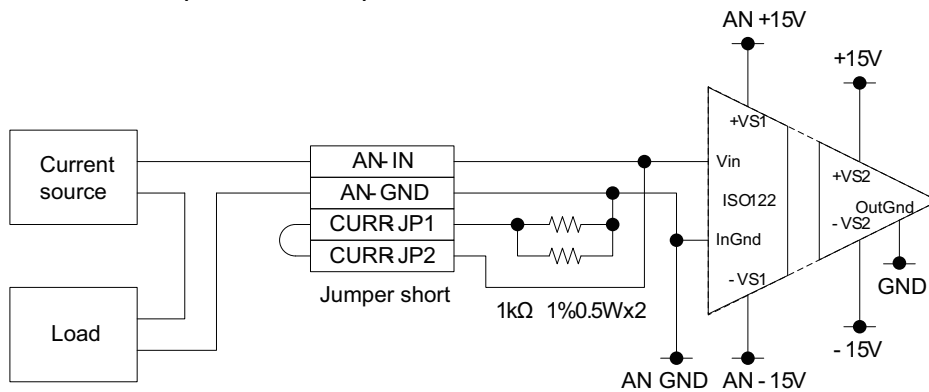
Note 2: When changing the input method, turn off the MC-3010A and on again to put change in effect.

2. WIRING

- Power voltage: Input the amount of power voltage change to the operational amplifier.



- Power current: Pass the power current to the shunt resistor, 1kΩ/parallel (combined resistance: 500Ω) to input the amount of voltage change at the both ends of the resistor to the operational amplifier.



Connector J3

Pin #	Signal name	In/Out	Description	Power voltage	Power current
1	AN1_IN	In	Analog 1 input	TTYCS(LA)-1	
2	AN1_GND	-	Analog 1 GND		
3	CURREN1_JP1	-	Analog 1 input, power current/voltage setting jumper 1	Pin #3-#4: open	Pin #3-#4: short
4	CURREN1_JP2	-	Analog 2 input, power current/voltage setting jumper 1		

Connector J4

Pin #	Signal name	In/Out	Description	Power voltage	Power current
1	AN2_IN	In	Analog 2 input	TTYCS(LA)-1	
2	AN2_GND	-	Analog 2 GND		
3	CURREN2_JP1	-	Analog 2 input, power current/voltage setting jumper 1	Pin #3-#4: open	Pin #3-#4: short
4	CURREN2_JP2	-	Analog 2 input, power current/voltage setting jumper 1		

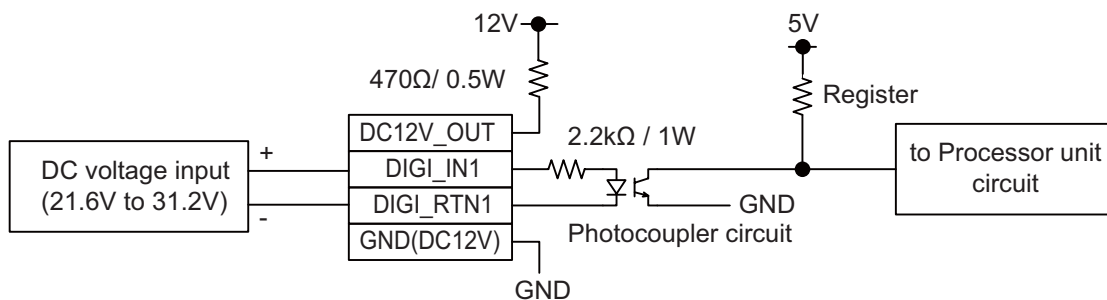
Connector J5

Pin #	Signal name	In/Out	Description	Power voltage	Power current
1	AN3_IN	In	Analog 3 input	TTYCS(LA)-1	
2	AN3_GND	-	Analog 3 GND		
3	CURR3_JP1	-	Analog 3 input, power current/voltage setting jumper 1	Pin #3-#4: open	Pin #3-#4: short
4	CURR3_JP2	-	Analog 3 input, power current/voltage setting jumper 1		

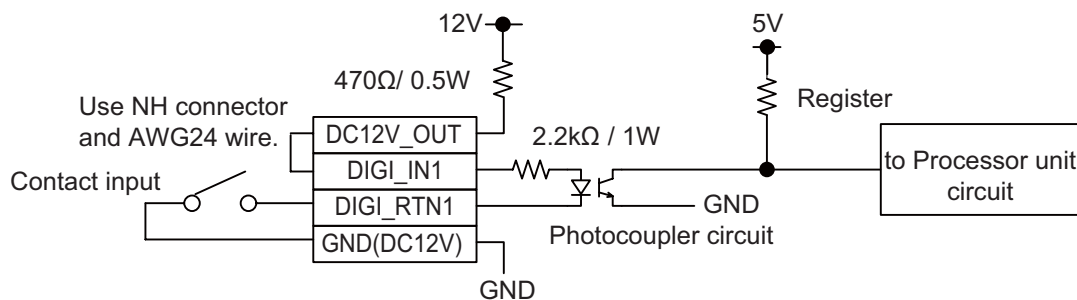
How to set ACK input (MC-3020D)

Use the connectors J3 to J6 on the MC-DIN Board (24P0116) to set the ACK input for ACK1 to ACK8 as shown below.

- Input circuit for voltage input



- Input circuit for contact input



Note 1: The input must not exceed the range of the input voltage, to prevent malfunction.

-Setting for voltage input: 21.6V to 31.2V

-Setting for contact input: Voltage cannot be input (contact signal only).

Note 2: For analog input, see paragraph 2.3.2

2. WIRING

Connector J3

Pin #	Signal name	In/Out	Remarks	ACK1 contact	ACK1 voltage	ACK2 contact	ACK2 voltage
1	DC12V_OUT	Out	ACK1 In	Pin #1-#2: short	No connection	-	
2	DIGI_IN1	In			MPYC-12		
3	DIGI_RTN1	Out		MPYC-12			
4	GND (DC12V)	In					
5	DC12V_OUT	Out	ACK2 In	-		Pin #1-#2: short	No connection
6	DIGI_IN2	In					MPYC-12
7	DIGI_RTN2	Out				MPYC-12	NO connection
8	GND (DC12V)	In					

Connector J4

Pin #	Signal name	In/Out	Remarks	ACK3 contact	ACK3 voltage	ACK4 contact	ACK4 voltage	
1	DC12V_OUT	Out	ACK3 In	Pin #1-#2: short	No connection	-		
2	DIGI_IN3	In			MPYC-12			
3	DIGI_RTN3	Out		MPYC-12	No connection			
4	GND (DC12V)	In						
5	DC12V_OUT	Out	ACK4 In	-		Pin #1-#2: short	No con- nection	
6	DIGI_IN4	In				MPYC-12		
7	DIGI_RTN4	Out				No con- nection		
8	GND (DC12V)	In						

Connector J5

Pin #	Signal name	In/Out	Remarks	ACK5 contact	ACK5 voltage	ACK6 contact	ACK6 voltage
1	DC12V_OUT	Out	ACK5 In	Pin #1-#2: short	No connection	-	
2	DIGI_IN5	In			MPYC-12		
3	DIGI_RTN5	Out		MPYC-12			
4	GND (DC12V)	In					
5	DC12V_OUT	Out	ACK6 In	-		Pin #1-#2: short	No connection
6	DIGI_IN6	In				MPYC-12	MPYC-12
7	DIGI_RTN6	Out					NO connection
8	GND (DC12V)	In					

Connector J6

Pin #	Signal name	In/Out	Remarks	ACK7 contact	ACK7 voltage	ACK8 contact	ACK8 voltage
1	DC12V_OUT	Out	ACK7 In	Pin #1-#2: short	No connection	-	
2	DIGI_IN7	In		MPYC-12	MPYC-12		
3	DIGI_RTN7	Out					
4	GND (DC12V)	In			No connection		
5	DC12V_OUT	Out	ACK8 In	-		Pin #1-#2: short	No connection
6	DIGI_IN8	In				MPYC-12	MPYC-12
7	DIGI_RTN8	Out					NO connection
8	GND (DC12V)	In					

How to set alarm output (MC-3030D)

Use the connector J3 to J6 on the MC_OUT Board (24P0117) to select NC (normal close) or NO (normal open) for alarm output 1 to 8.

Connector J3

Pin #	Signal name	In/ Out	Remarks	Alarm1 NO Out	Alarm1 NC Out	Alarm2 NO Out	Alarm2 NC Out
1	A1	Out	Alarm1 Out	MPYC-12	No connection	-	
2	COM1			No connection	MPYC-12		
3	B1						
4	A2	Out	Alarm2 Out	-		MPYC-12	No connection
5	COM2					No connection	MPYC-12
6	B2						

Connector J4S

Pin #	Signal name	In/ Out	Remarks	Alarm3 NO Out	Alarm3 NC Out	Alarm4 NO Out	Alarm4 NC Out	
1	A3	Out	Alarm3 Out	MPYC-12	No connection	-		
2	COM3				MPYC-12			
3	B3			No connection				
4	A4		Alarm4 Out	-			MPYC-12	No connection
5	COM4						MPYC-12	
6	B4						No connection	

2. WIRING

Connector J5

Pin #	Signal name	In/Out	Remarks	Alarm5 NO Out	Alarm5 NC Out	Alarm6 NO Out	Alarm6 NC Out
1	A5	Out	Alarm5 Out	MPYC-12	No connection	-	
2	COM5				MPYC-12		
3	B5			No connection			
4	A6		Alarm5 Out	-		MPYC-12	No connection
5	COM6						MPYC-12
6	B6					No connection	

Connector J6

Pin #	Signal name	In/Out	Remarks	Alarm7 NO Out	Alarm7 NC Out	Alarm8 NO Out	Alarm8 NC Out
1	A7	Out	Alarm7 Out	MPYC-12	No connection	-	
2	COM7				MPYC-12		
3	B7			No connection			
4	A8		Alarm8 Out	-		MPYC-12	No connection
5	COM8						MPYC-12
6	B8					No connection	

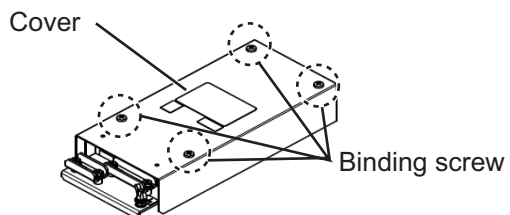
Case packing OP24-29

The optional kit OP24-29 protects the connectors on the MC-3010A/3020D/3030D to waterproofing standard IPX2.

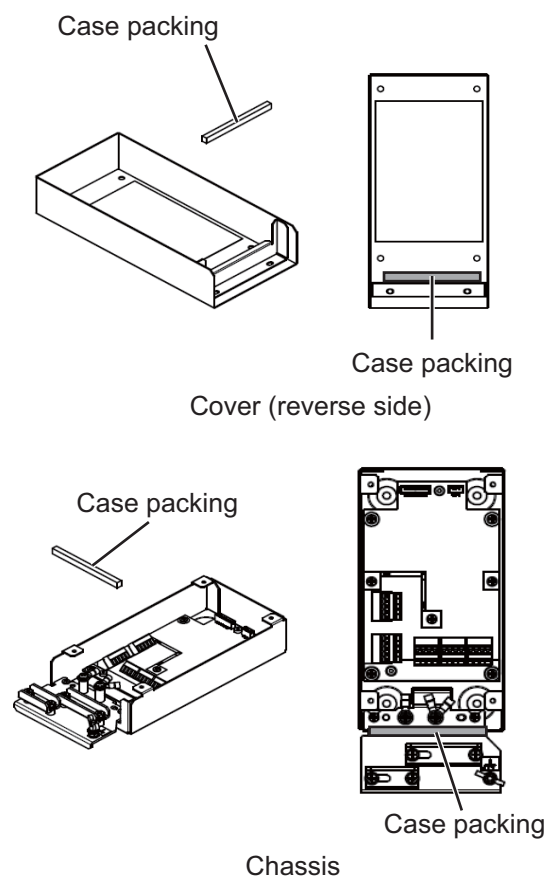
Case packing (type: OP24-29, code no.: 001-169-970)

Name	Type	Code No.	Qty	Remarks
Case packing (analog)	21-014-2052-2	100-367-961-10	2	MC-3010A/3020D/3030D

1. Unfasten four binding screws to remove the cover from the adapter.



2. Peel the paper from the case packing, then attach the case packing to the reverse side of the cover and the body unit as shown below.

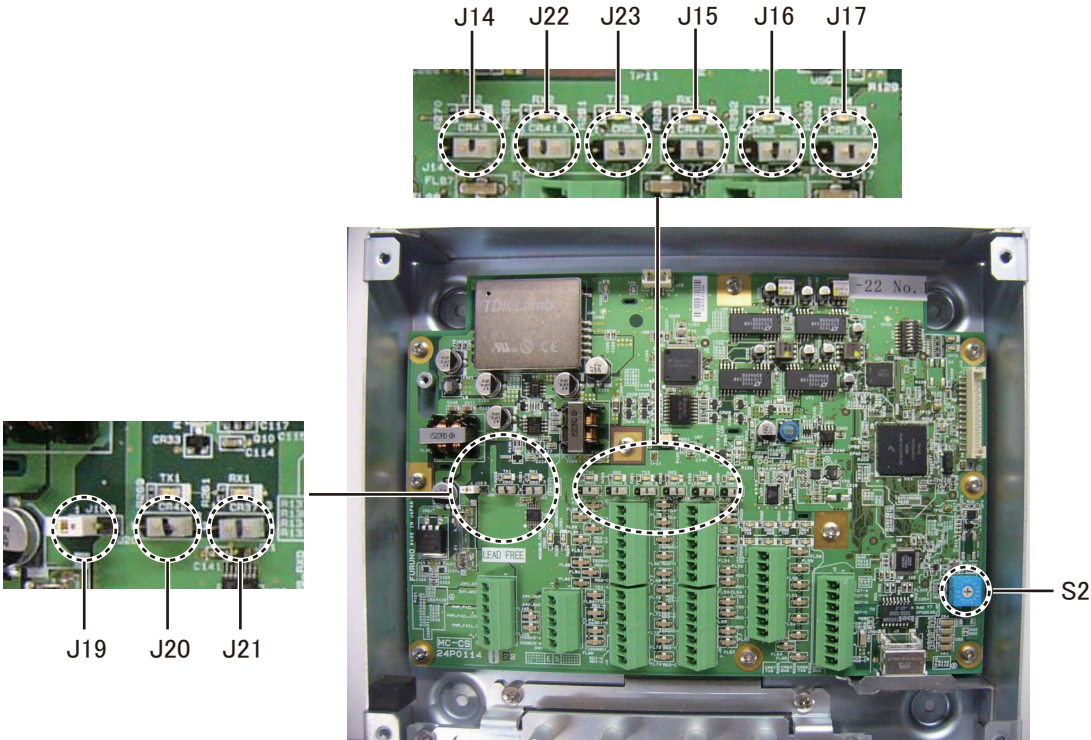


3. Attach the cover to the MC-3010A/3020D/3030D chassis.

2.3.3 How to set jumper blocks in the sensor adapters

MC-3000S

See the jumper blocks in the MC-CS Board (24P0114) referring to the tables that follow.



MC-CS Board (24P0114)

Rotary switch: Use the rotary switch (S2) to set the Modbus address when setting connectors J4/J5 to Modbus. The Modbus address set at J4/J5 in the network is not used. When setting J4/J5 to IEC61162-1/2, use the default setting ("0").

Jumper block:

Use the jumper block J19 to set the termination resistor on/off for the MODBUS communication on the connector J1. For the first and last sensor adapter in a series, their termination resistors should be set to ON. Use the MC-CS Board with the default setting because it becomes the "first" adapter in a series.

Jumper block J19		Connector J1
1-2	SHORT	Termination resistor: ON (default setting)
2-3	OPEN	
1-2	OPEN	Termination resistor: OFF
2-3	SHORT	

Set the jumper blocks J14 through J17 to turn the termination resistors on connectors J4 through J7 respectively.

(Termination resistor ON)

- When setting the starting/ending terminal for the multipoint, or the multipoint is not connected (CH1 to 4).
- When setting the starting/ending terminal for Modbus (CH1, CH2)

(Terminal resistor OFF)

- When setting the terminal other than starting/ending for the multipoint (CH1 to 4).
- When setting the terminal other than starting/ending for Modbus (CH1/CH2)

Jumper block J14		Connector J4 (CH1)
1-2	SHORT	Termination resistor: ON (default setting)
2-3	OPEN	
1-2	OPEN	Termination resistor: OFF
2-3	SHORT	

Jumper block J15		Connector J5 (CH2)
1-2	SHORT	Termination resistor: ON (default setting)
2-3	OPEN	
1-2	OPEN	Termination resistor: OFF
2-3	SHORT	

Jumper block J16		Connector J6 (CH3)
1-2	SHORT	Termination resistor: ON (default setting)
2-3	OPEN	
1-2	OPEN	Termination resistor: OFF
2-3	SHORT	

Jumper block J17		Connector J7 (CH4)
1-2	SHORT	Termination resistor: ON (default setting)
2-3	OPEN	
1-2	OPEN	Termination resistor: OFF
2-3	SHORT	

Set the jumper blocks J20 and J21 to choose the communication type (IEC-61162-1/2 or MODBUS) of the connector J4 (CH1).

The setting of the jumper block JP20 and JP21 must be identical.

Jumper block J20/J21		Communication type of J4 (between RD1 and TD1)
1-2	OPEN	IEC-61162-1/2 (default setting)
2-3	SHORT	
1-2	SHORT	MODBUS (The setting of J14 is different depending on the unit position (starting/ending terminal).)
2-3	OPEN	

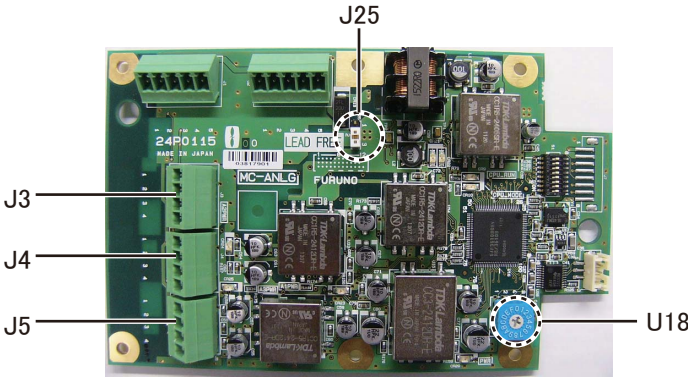
The jumper blocks J22 and J23 are used to set the communication type of the connector J5 (CH2).

Jumper block J22/J23		Communication type of J5 (between RD2 and TD2)
1-2	OPEN	IEC-61162-1/2 (default setting)
2-3	SHORT	
1-2	SHORT	MODBUS (The setting of J15 is different depending on the unit position (starting/ending terminal).)
2-3	OPEN	

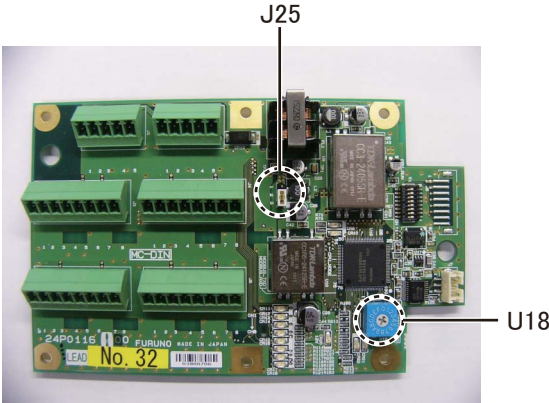
MC-3010A/3020D/3030D

This paragraph shows how to set the MC-ANLG Board (24P0115, for MC-3010A), MC-DIN Board (24P0116, for MC-3020D) and MC-DOUT Board (24P0117, for MC-3030D).

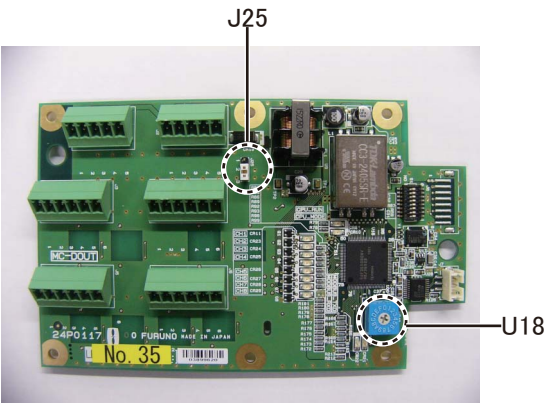
Rotary switch: Use the rotary switch (U18) to set the MODBUS address with a digit of number from “0”. When multiple sensor adapters are connected to the MC-3000S, the same number cannot be used among them. (It is allowed to use the same number between the MC-3000S and a sensor adapter.)



MC-ANLG Board (24P0115)



MC-DIN Board (24P0116)



MC-DOUT Board (24P0117)

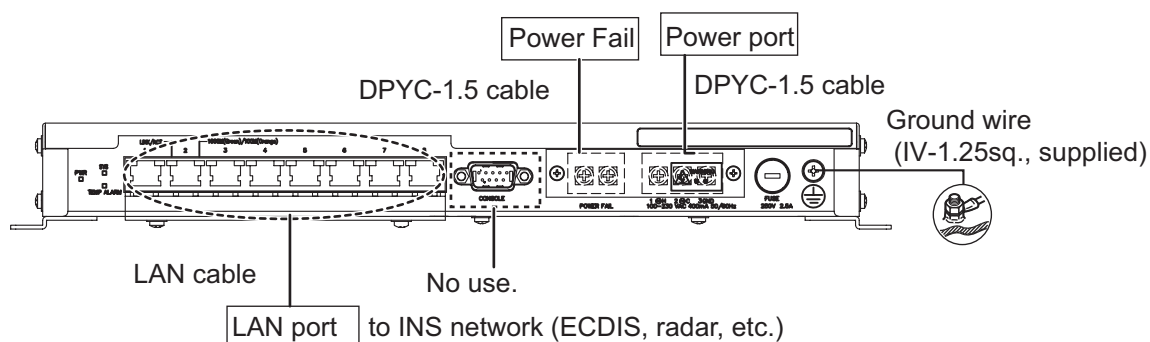
Jumper block

Use the jumper block J25 to set the termination resistor on/off for the MODBUS communication on the connector J1. For the first and last sensor adapter in a series, their termination resistors should be set to ON. If not, communication between sensor adapters is not possible.

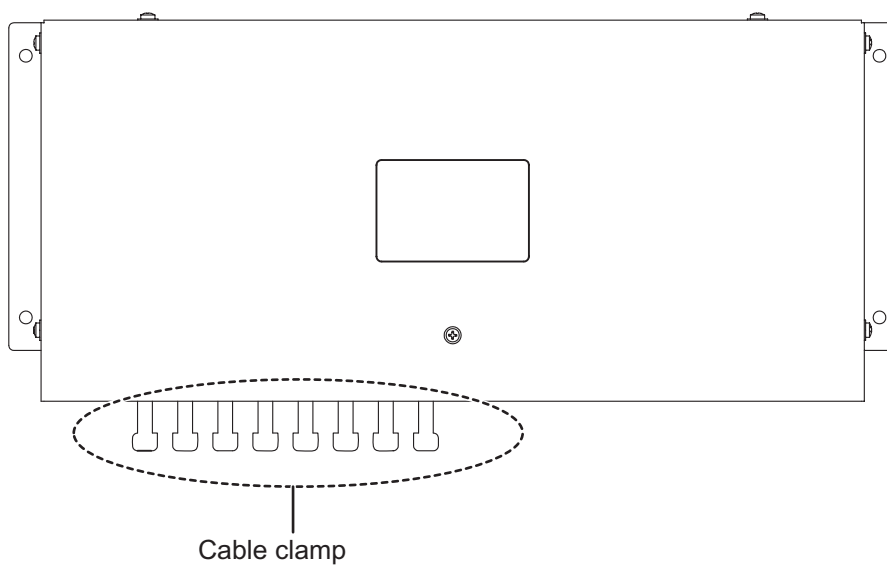
Jumper block J25		Connector J1
1-2	OPEN	Termination resistor: ON
2-3	SHORT	
1-2	SHORT	Termination resistor: OFF (default setting)
2-3	OPEN	

2.4 Intelligent HUB HUB-3000 (option)

Fix the LAN cable connected to the cable clamp using the cable ties (supplied).



Attach the LAN cap (supplied) to the unused connector holes to provide waterproofing standard IPX2.



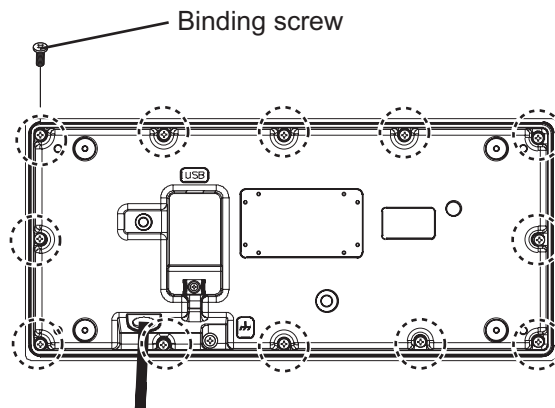
2.5 How to Extend the Control Unit Cable (option)

To extend the length of the cable between the control unit and the processor unit, use the optional cable assy 6TPSH-XH12X2-LxxSP1 (for RCU-024) or 6TPSH-XH12X2-LxxSP2 (for RCU-026). You can select the cable length from among 10, 20 and 30 m.

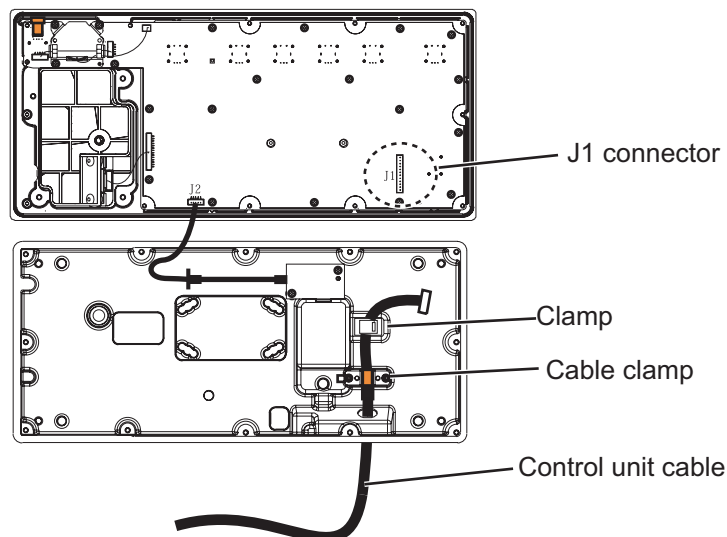
2.5.1 ECDIS control unit (RCU-024)

1. Unfasten 12 binding screws (M3x8) from the bottom of the control unit to remove the cover.

Note: Do not add stress to the cables connected to the control unit board when removing the cover.

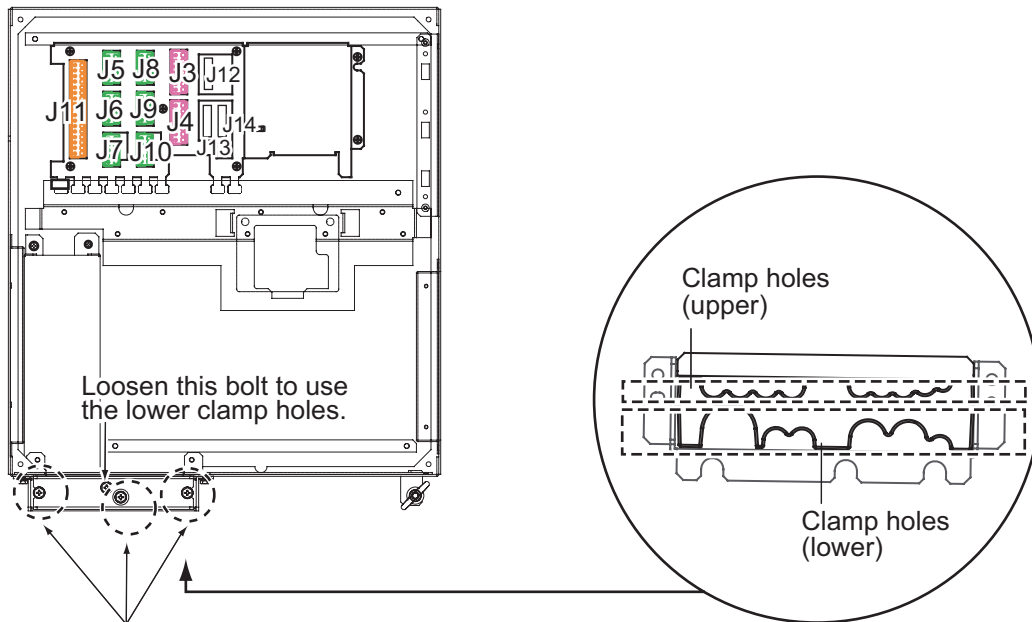


2. Unfasten two pan head screws (M3x12) to remove the clamp and cable clamp from the control unit, then disconnect the control unit cable from the J1 connector.



3. Pull out the control unit cable from the cover.
4. Pass the optional cable assy (6TPSH-XH12X2-LxxSP1) through the cable hole on the control unit.
5. Fasten the shield part of the cable assy with the cable clamp (removed at step 2), then connect the connector at the end of the cable assy to the J1 on the control unit board.
6. Reattach the control unit cover.
7. Unfasten four screws (M4x8) to remove the processor unit cover.

8. Unfasten three bolts to remove the cable clamp (upper) as shown below.



Loosen these three bolts to remove the upper plate.

9. Disconnect the control unit cable from the processor unit, then connect the cable assy (6TPSH-XH12X2-LxxSP1).
10. Set the shield part of cables under the cable clamp then tighten the cable clamp.



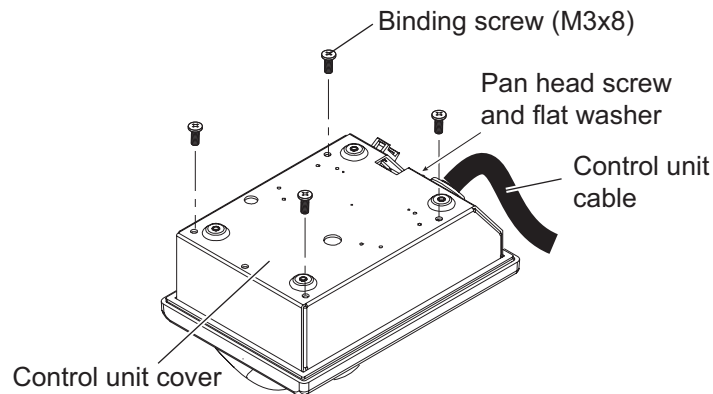
Lay shields of cables under this clamp then tighten the clamp.

11. Attach the processor unit cover.

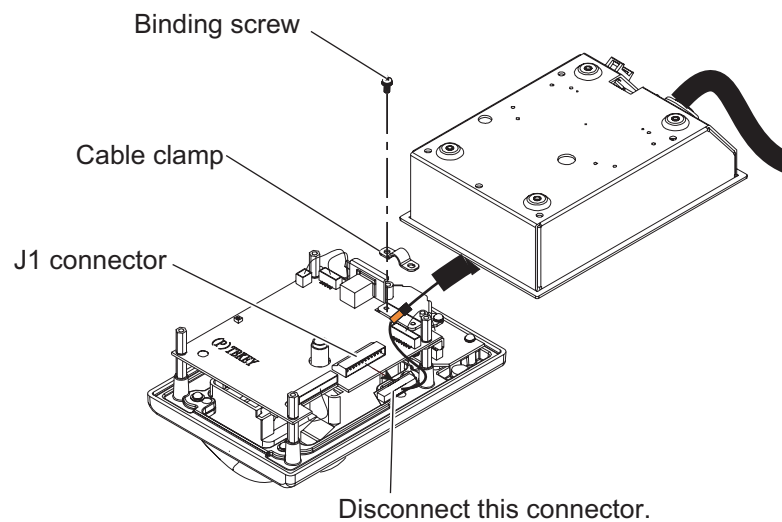
2.5.2 Trackball control unit (RCU-026)

1. Unfasten four binding screws (M3x8) from the bottom of the control unit, and a pan head screw (M3x8) and flat washer from the back of the control unit to remove the cover.

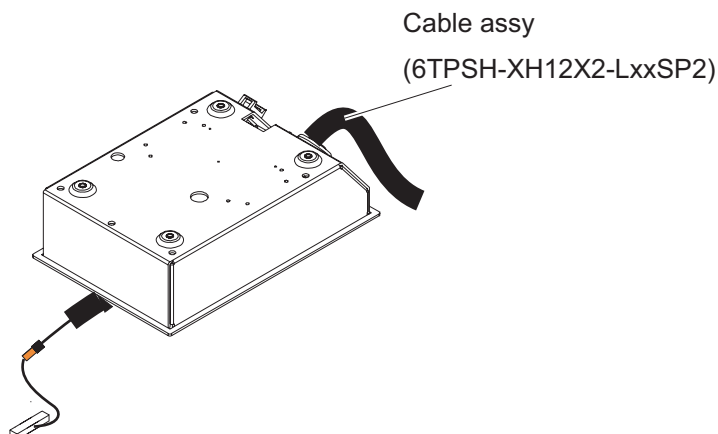
Note: Be careful not to add stress to the cables connected to the control unit board when removing the cover.



2. Remove the cable clamp from the control unit, then disconnect the control unit cable from the J1 connector.

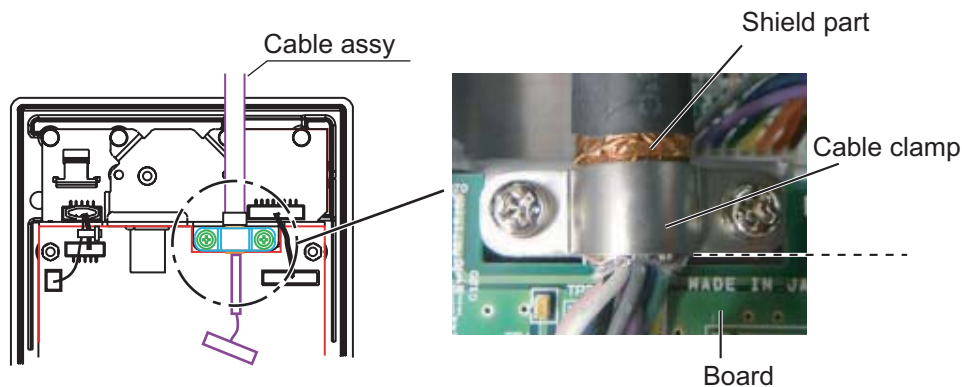


3. Pull out the control unit cable from the cover.
4. Pass the optional cable assy (6TPSH-XH12X2-LxxSP2) through the cable hole on the cover.

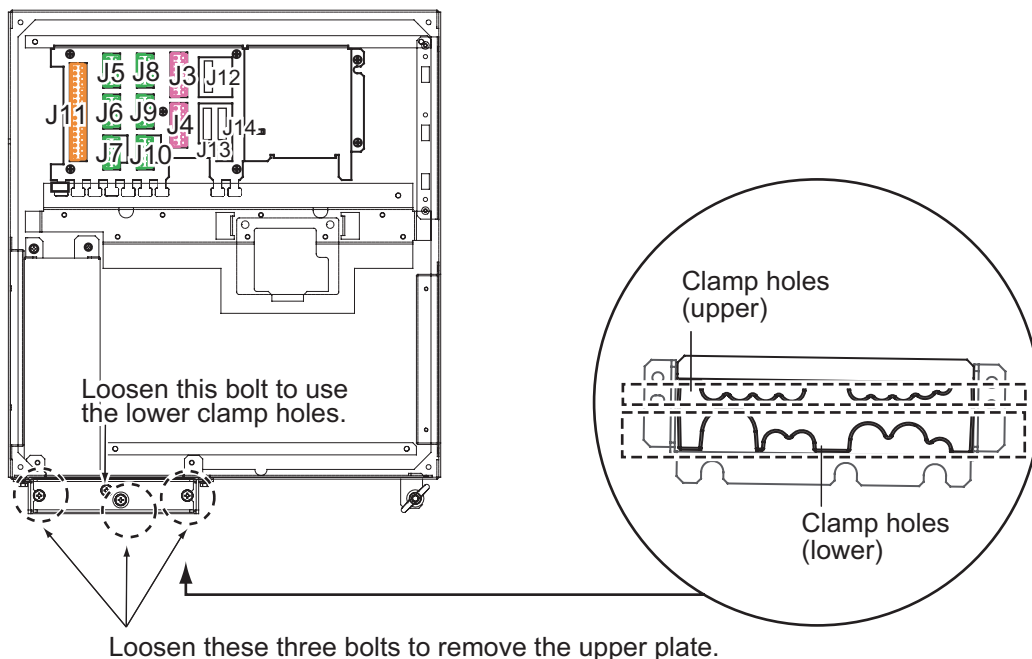


5. Fasten the shield part of the cable assy with the cable clamp (removed at step 2), then connect the connector at the end of the cable assy to the J1 on the control unit board.

Note: When clamping, the shield part of the cable must not touch the circuit board.



6. Reattach the control unit cover.
7. Unfasten four screws (M4x8) to remove the processor unit cover.
8. Unfasten three bolts to remove the cable clamp (upper) as shown below.



9. Disconnect the control unit cable from the processor unit, then connect the cable assy (6TPSH-XH12X2-LxxSP2).

2. WIRING

10. Set the shields of cables under the cable clamp then tighten the cable clamp.

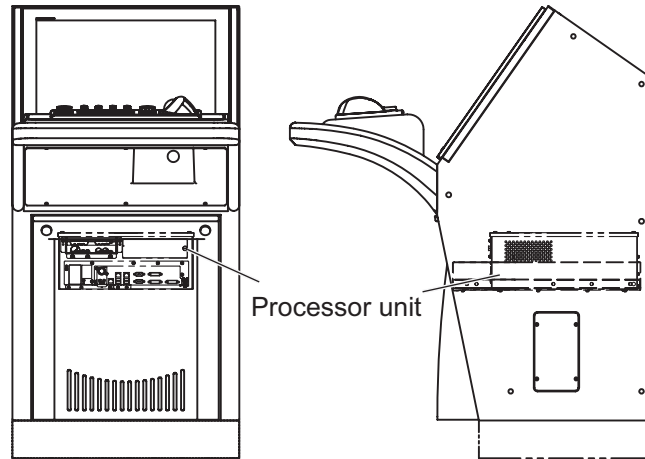


Lay shields of cables
under this clamp then
tighten the clamp.

11. Remount the processor unit cover.

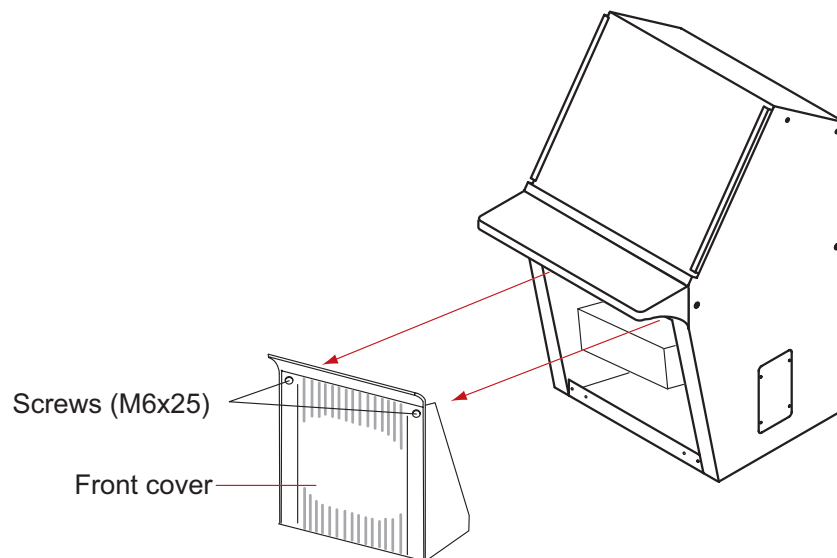
3. ECN-303/304 (OPTION)

This section provides the information necessary for installing the display unit console ECN-303/304.



3.1 How to Install the Console

1. Install a channel base (height: 100 m), consulting with the shipyard.
2. Pass a lifting belt through the four eye bolts at the top of the console. Hoist the console with a crane and place it on top of the channel base.
3. Remove the front cover of the console by unfastening two screws.



4. Fix the console to the channel base with six hexagon head bolts (M12, local supply).
5. Remove the four eye bolts. Cover the four holes for the eye bolts with the caps supplied.

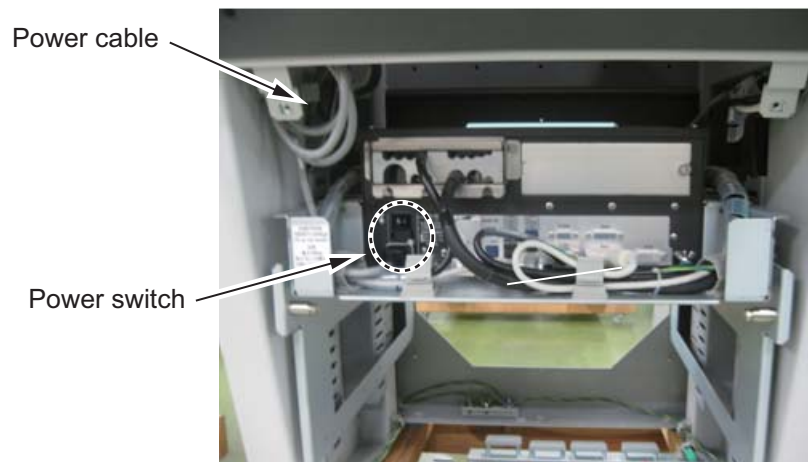
3.2 How to Dismount the Rack for the Processor Unit

If it is difficult to access the inside bottom of the console (for wiring), follow the procedure in this section to remove the rack for the processor unit. Otherwise, go to paragraph 3.3 How to Connect the External Cables.

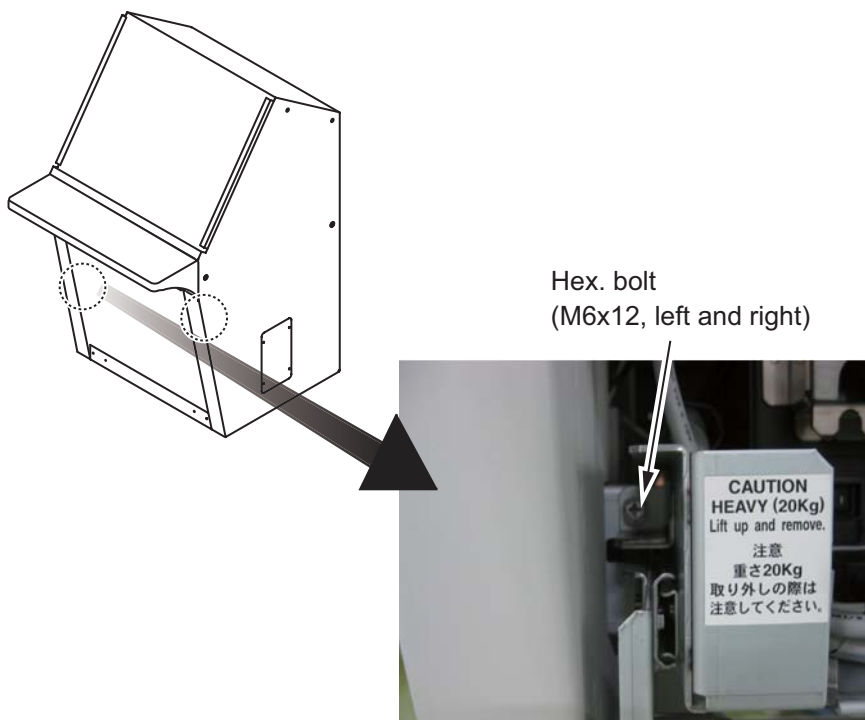
Note 1: Leave sufficient space at the sides and rear of the unit to facilitate maintenance.

Note 2: Confirm that the power switch of the ECDIS is turned off before starting the installation.

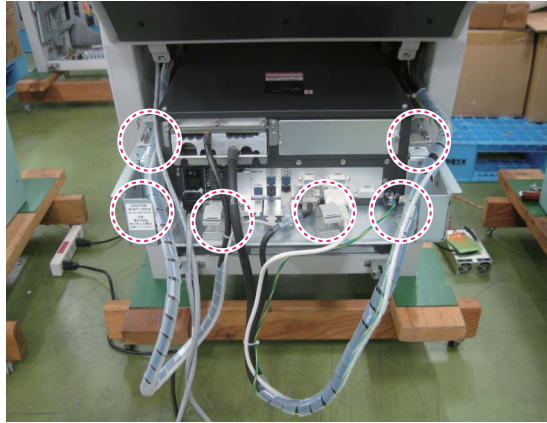
1. Unfasten the cable clamp at the top-left hand side in the console to release the power cable.



2. Unfasten two hex. bolts (M6) to pull the rack for the processor unit toward you until you hear a click.
The rack comes to a stop against the stoppers on the right and left rails.



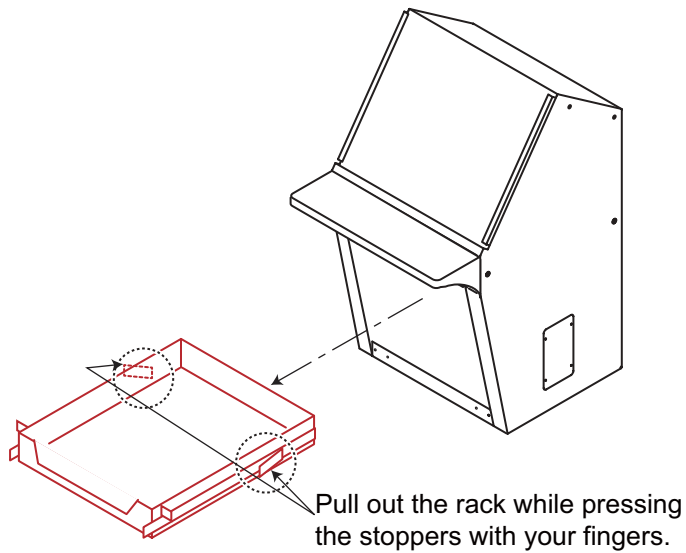
3. Release all cables other than the power cable from their cable clamps. There are six cable clamps on the rack as shown below.



4. Press the stoppers with your fingers to unlock them to release the rack, then pull out the rack slowly.

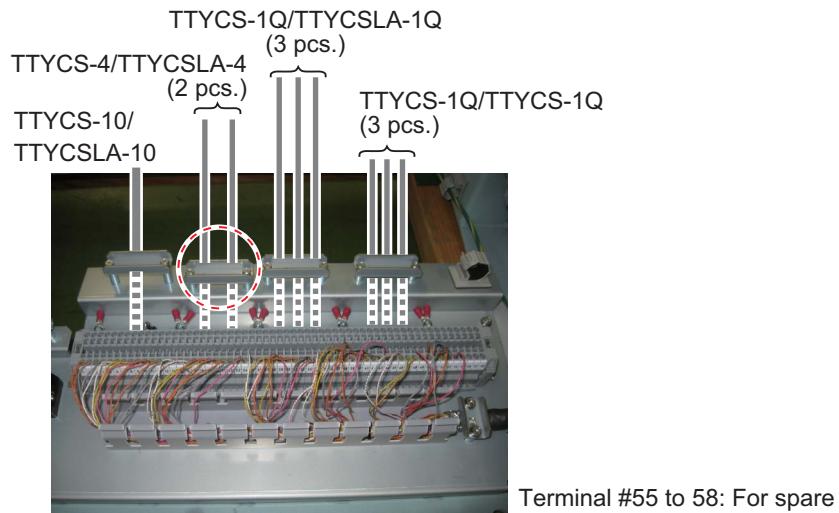
Note 1: When dismantling the processor unit from the console, be careful not to apply tension on the cables.

Note 2: The processor unit weighs 20 kg. Hold the rack securely so that it will not drop to the deck.

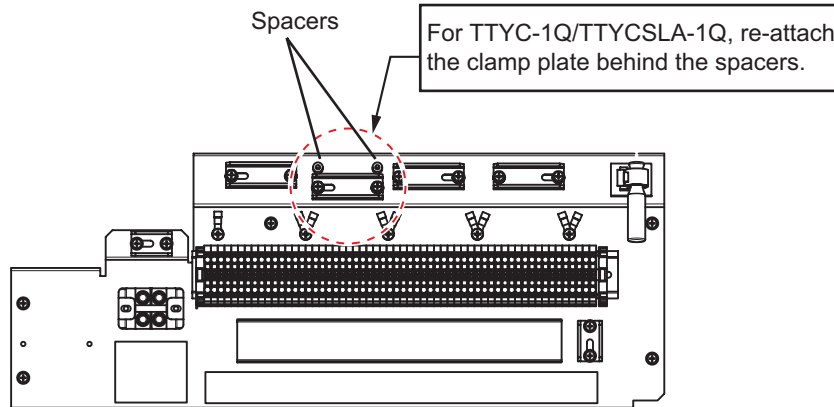


3.3 How to Connect External Cables

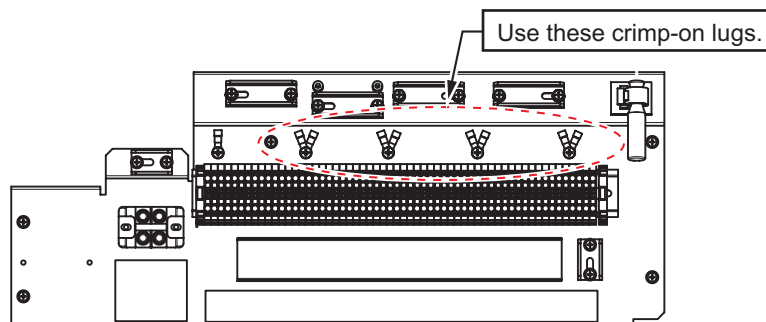
Pass the cables from external equipment through the bottom of the console. Connect the cables to the terminal board as shown in the interconnection diagrams in this manual and the label attached to the bottom of the console. Lay shields of cables under clamps then tighten clamps.

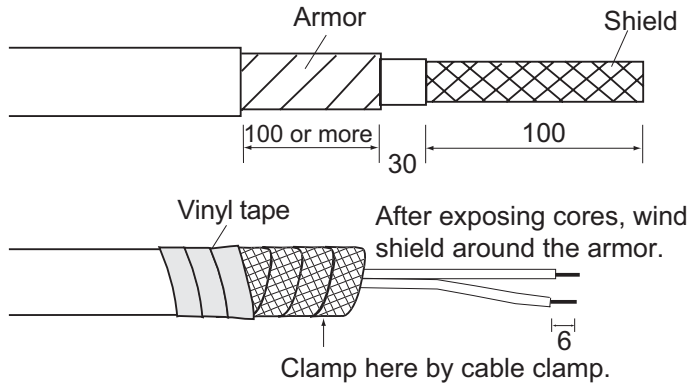
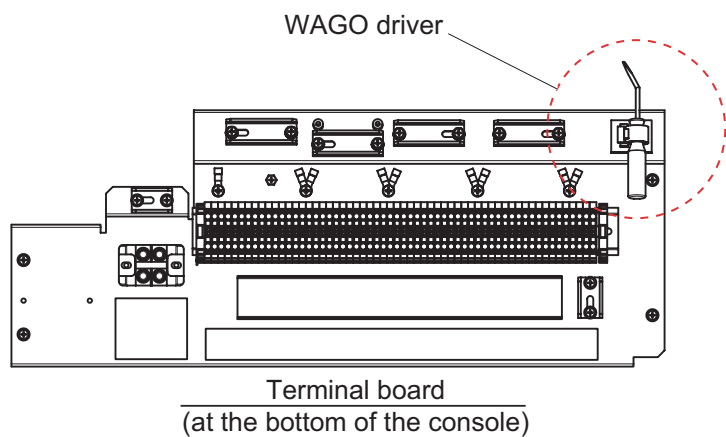
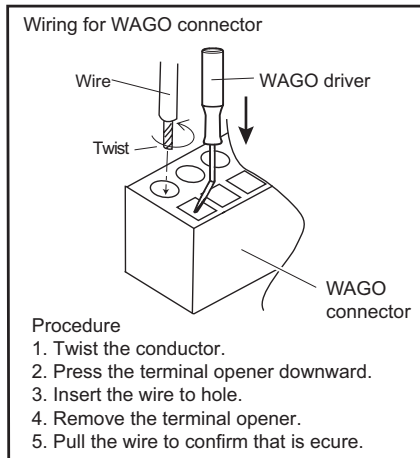
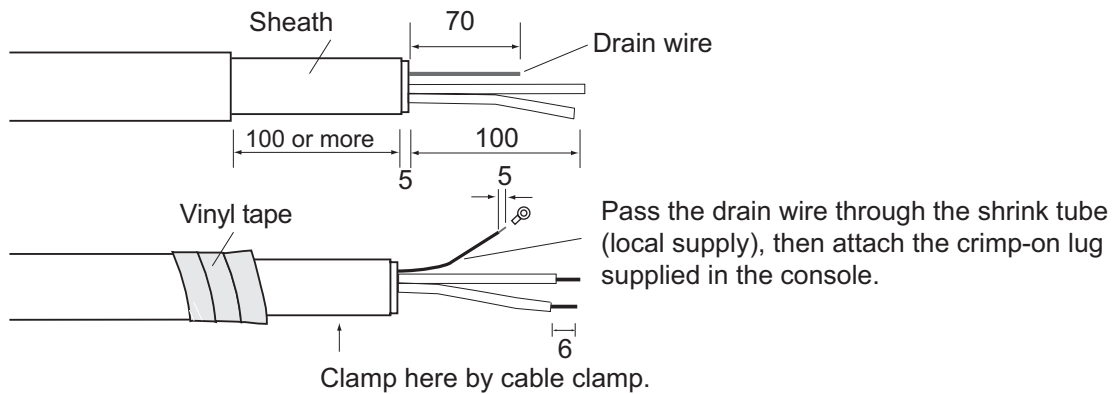


Note 1: The illustration below shows where to locate cables on the cable clamp. The location for the TTYCS-4/TTYCSLA-4 cables can alternately accommodate TTYC-1Q/TTYCSLA-1Q cables. In this case, unfasten two hex. bolts to remove the clamp plate and fasten it behind the clamp base.



Note 2: For TTYCSLA cables, attach their drain wires to the crimp-on lugs pre-fas-tened near the terminal board.



Fabrication of TTYCS cableFabrication of TTYCSLA cable

- Connectors J3/J4 on the I/O Board in the processor unit can be set to IEC61162-1 or 2. This console is shipped with the setting for IRC61162-2.
- The connector J11 on the I/O Board in the processor unit can be set to the contact input or digital input. This console is shipped with the setting for the contact input.

3.4 How to Mount the Rack for the Processor Unit

After completing the wiring, remount the rack if it was removed at section 3.2.

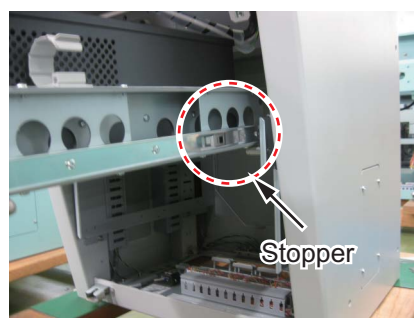
Note: Leave sufficient space at the sides and rear of the unit to facilitate maintenance.

1. Confirm that the power switch on the EC-3000 is turned off before doing this procedure.
2. Set the rack for the processor unit to the rails until the rack contacts the stoppers on the rails.

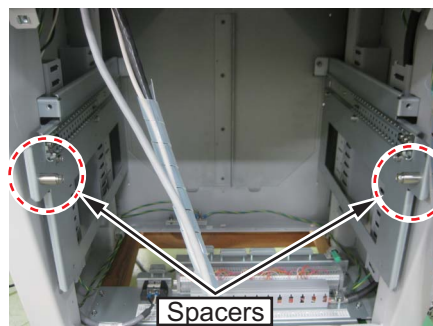
Note 1: When remounting the processor unit from the console, be careful not to apply tension to cables.

Note 2: The processor unit weighs 20 kg. Hold the rack securely so that it will not drop to the deck.

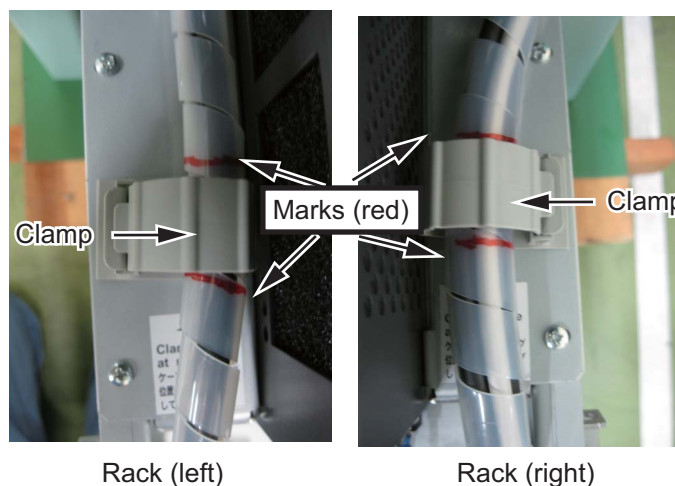
Note 3: Do not tilt the processor unit to insert into the console unit.



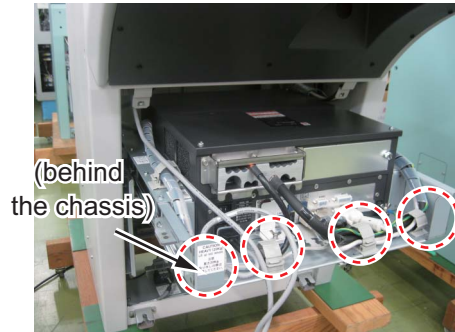
If you could not put the rack on the rails immediately, you can rest the rack on the spacers shown below.



3. Fasten the cables from the processor unit with clamps at the left and right hand sides of the rack at the position of the red-colored marks on the cables.

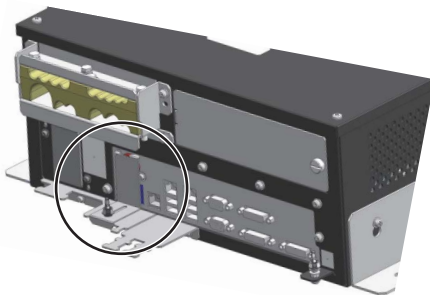


4. Press the stoppers with your fingers to unlock them to release the rack, then push the rack into the console.
5. Fasten two hex. bolts (M6, removed at step 2 in section 3.2.) to fix the rack to the console.
6. Fasten the cables from the processor unit with four clamps at the front of the rack.

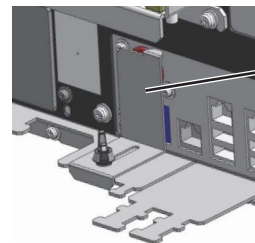


Location of four clamps

7. Use the clamp (see step 1 in section 3.2) to refasten the power cable.



Processor unit, front view



keep the dummy
plate in this
position.

8. Fix the front cover to the console with two screws.

3. ECN-303/304 (OPTION)

This page is intentionally left blank.

APPENDIX 1 JIS CABLE GUIDE

Cables listed in the manual are usually shown as Japanese Industrial Standard (JIS). Use the following guide to locate an equivalent cable locally.

JIS cable names may have up to 6 alphabetical characters, followed by a dash and a numerical value (example: DPYC-2.5). For core types D and T, the numerical designation indicates the *cross-sectional Area (mm²)* of the core wire(s) in the cable. For core types M and TT, the numerical designation indicates the *number of core wires* in the cable.

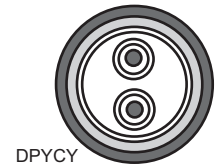
1. Core Type 2. Insulation Type 3. Sheath Type

D Double core power line **P** Ethylene Propylene Rubber **Y** PVC (Vinyl)

T Triple core power line

M Multi core

TT Twisted pair communications (1Q=quad cable)



DPYCY



TPYCY



MPYC-4



TTYCSLA-4

4. Armor Type

C Steel

5. Sheath Type

Y Anticorrosive vinyl sheath

6. Shielding Type

SLA All cores in one shield, plastic tape w/aluminum tape

-SLA Individually shielded cores, plastic tape w/aluminum tape

EX: ^{1 2 3 4 5 6}DPYCYSLA - 1.5 ^{1 2 3 4}MPYC - 4

Designation type Core Area (mm²) Designation type # of cores

The following reference table lists gives the measurements of JIS cables commonly used with Furuno products:

Type	Core Area	Core Diameter	Cable Diameter	Type	Core Area	Core Diameter	Cable Diameter
DPYC-1.5	1.5mm ²	1.56mm	11.7mm	TPYCY-1.5	1.5mm ²	1.56mm	14.5mm
DPYC-2.5	2.5mm ²	2.01mm	12.8mm	TPYCY-2.5	2.5mm ²	2.01mm	15.5mm
DPYC-4	4.0mm ²	2.55mm	13.9mm	TPYCY-4	4.0mm ²	2.55mm	16.9mm
DPYC-6	6.0mm ²	3.12mm	15.2mm	TPYCYSLA-1.5	1.5mm ²	1.56mm	13.9mm
DPYC-10	10.0mm ²	4.05mm	17.1mm	TTYC-7SLA	0.75mm ²	1.11mm	20.8mm
DPYC-16	16.0mm ²	5.10mm	19.4mm	TTYCSLA-1	0.75mm ²	1.11mm	9.4mm
DPYCY-1.5	1.5mm ²	1.56mm	13.7mm	TTYCSLA-1Q	0.75mm ²	1.11mm	10.8mm
DPYCY-2.5	2.5mm ²	2.01mm	14.8mm	TTYCSLA-4	0.75mm ²	1.11mm	15.7mm
DPYCY-4	4.0mm ²	2.55mm	15.9mm	TTYCY-4SLA	0.75mm ²	1.11mm	19.5mm
DPYCYSLA-1.5	1.5mm ²	1.56mm	11.9mm	TTYCYSLA-1	0.75mm ²	1.11mm	11.2mm
DPYCYSLA-2.5	2.5mm ²	2.01mm	13.0mm	TTYCYSLA-4	0.75mm ²	1.11mm	17.9mm
MPYC-2	1.0mm ²	1.29mm	10.0mm				
MPYC-4	1.0mm ²	1.29mm	11.2mm				
MPYC-7	1.0mm ²	1.29mm	13.2mm				
MPYCY-12	1.0mm ²	1.29mm	19.0mm				
MPYCY-19	1.0mm ²	1.29mm	22.0mm				

APPENDIX 2 ROD TERMINALS

MC-3000S, MC-CS Board (24P0114)

Connector #	Pin #	Signal name	Rod terminal to use	Connected cable
J1	1	24V_VOUT	AI 0.34-6 TQ (blue)	MC1.5-W-Lxxx
	2	24V_GND		
	3	MODBUS-A	AI 0.14-8 GY (gray)	
	4	MODBUS-B		
	5	GND		
Connector #	Pin #	Signal name	Rod terminal to use	Connected cable
J2	1	24V_IN	AI 1.5-6 BK (black)	DPYC-1.5
	2	24V_OUT		
	3	PWR_FAIL-A	AI 0.75-6 GY (Gray)	TTYCS-4
	4	PWR_FAIL-COM		TTYCSLA-4
	5	PWR_FAIL-B		
	6	NC	-	-
Connector #	Pin #	Signal name	Rod terminal to use	Connected cable
J4	1	TD1-A	AI 0.75-6 GY (Gray)	TTYCS-4 TTYCSLA-4
	2	TD1-B		
	3	RD1-A		
	4	RD1-B		
	5	ISOGND1		
	6	RD1-H		
	7	RD1-C		
Connector #	Pin #	Signal name	Rod terminal to use	Connected cable
J5	1	TD2-A	AI 0.75-6 GY (gray)	TTYCS-4 TTYCSLA-4
	2	TD2-B		
	3	RD2-A		
	4	RD2-B		
	5	ISOGND2		
	6	RD2-H		
	7	RD2-C		
Connector #	Pin #	Signal name	Rod terminal to use	Connected cable
J6	1	TD3-A	AI 0.75-6 GY (gray)	TTYCS-4 TTYCSLA-4
	2	TD3-B		
	3	RD3-A		
	4	RD3-B		
	5	ISOGND3		
	6	RD3-H		
	7	RD3-C		

Connector #	Pin #	Signal name	Rod terminal to use	Connected cable
J7	1	TD4-A	AI 0.75-6 GY (gray)	TTYCS-4 TTYCSLA-4
	2	TD4-B		
	3	RD4-A		
	4	RD4-B		
	5	ISOGND4		
	6	RD4-H		
	7	RD4-C		
Connector #	Pin #	Signal name	Rod terminal to use	Connected cable
J8	1	TD5-A	AI 0.75-6 GY (gray)	TTYCS-1Q TTYCSLA-1Q
	2	TD5-B		
	3	RD5-H		
	4	RD5-C		
	5	TD6-A		TTYCS-1Q TTYCSLA-1Q
	6	TD6-B		
	7	RD6-H		
	8	RD6-C		
Connector #	Pin #	Signal name	Rod terminal to use	Connected cable
J9	1	TD7-A	AI 0.75-6 GY (gray)	TTYCS-1Q TTYCSLA-1Q
	2	TD7-B		
	3	RD7-H		
	4	RD7-C		
	5	TD8-A		TTYCS-1Q TTYCSLA-1Q
	6	TD8-B		
	7	RD8-H		
	8	RD8-C		

MC-3010A MC-ANALG Board (24P0115)

Connector #	Pin #	Signal name	Rod terminal to use	Connected cable
J1	1	24V_IN	AI 0.34-6 TQ (blue)	MC1.5-W-Lxxx
	2	24V_GND		
	3	MODBUS-A	AI 0.14-8 GY (gray)	
	4	MODBUS-B		
	5	GND		

Connector #	Pin #	Signal name	Rod terminal to use	Connected cable
J2	1	24V_OUT	AI 0.34-6 TQ (blue)	MC1.5-W-Lxxx
	2	24V_GND		
	3	MODBUS-A	AI 0.14-8 GY (gray)	
	4	MODBUS-B		
	5	GND		

Connector #	Pin #	Signal name	Rod terminal to use	Connected cable
J3*	1	AN1_IN	AI 0.75-6 GY (gray)	TTYCS-1 TTYCSLA-1
	2	AN1_GND		
	3	CURR1_JP1		
	4	CURR1_JP2		

Connector #	Pin #	Signal name	Rod terminal to use	Connected cable
J4*	1	AN2_IN	AI 0.75-6 GY (gray)	TTYCS-1 TTYCSLA-1
	2	AN2_GND		
	3	CURR2_JP1		
	4	CURR2_JP2		

Connector #	Pin #	Signal name	Rod terminal to use	Connected cable
J5*	1	AN3_IN	AI 0.75-6 GY (gray)	TTYCS-1 TTYCSLA-1
	2	AN3_GND		
	3	CURR3_JP1		
	4	CURR3_JP2		

*: For pin #3 and 4, no cable is connected. However the jumper connection is necessary depending on the input specification.

MC-3020D, MC-DIN Board (24P0116)

Connector #	Pin #	Signal name	Rod terminal to use	Connected cable
J1	1	24V_IN	AI 0.34-6 TQ (blue)	MC1.5-W-Lxxx
	2	24V_GND		
	3	MODBUS-A	AI 0.14-8 GY (gray)	
	4	MODBUS-B		
	5	GND		

Connector #	Pin #	Signal name	Rod terminal to use	Connected cable
J2	1	24V_OUT	AI 0.34-6 TQ (blue)	MC1.5-W-Lxxx
	2	24V_GND		
	3	MODBUS-A	AI 0.14-8 GY (gray)	
	4	MODBUS-B		
	5	GND		

Connector #	Pin #	Signal name	Rod terminal to use	Connected cable
J3*	1	DV12V_OUT1	AI 1-6 RD (red)	MPYC-12
	2	DIGI_IN1		
	3	DIGI_RTN1		
	4	GND		
	5	DC12V_OUT2		
	6	DIGI_IN2		
	7	DIGI_RTN2		
	8	GND		

Connector #	Pin #	Signal name	Rod terminal to use	Connected cable
J4*	1	DV12V_OUT3	AI 1-6 RD (red)	MPYC-12
	2	DIGI_IN3		
	3	DIGI_RTN3		
	4	GND		
	5	DC12V_OUT4		
	6	DIGI_IN4		
	7	DIGI_RTN4		
	8	GND		

Connector #	Pin #	Signal name	Rod terminal to use	Connected cable
J5*	1	DV12V_OUT5	AI 1-6 RD (red)	MPYC-12
	2	DIGI_IN5		
	3	DIGI_RTN5		
	4	GND		
	5	DC12V_OUT6		
	6	DIGI_IN6		
	7	DIGI_RTN6		
	8	GND		

*: Pin #1 and 5: no cable connection. However the jumper connection is necessary between #1 and 2 and #5 and 6 depending on the input specification.

APPENDIX 2 ROD TERMINALS

Connector #	Pin #	Signal name	Rod terminal to use	Connected cable
J6*	1	DV12V_OUT7	AI 1-6 RD (red)	MPYC-12
	2	DIGI_IN7		
	3	DIGI_RTN7		
	4	GND		
	5	DC12V_OUT8		
	6	DIGI_IN8		
	7	DIGI_RTN8		
	8	GND		

*: Pin #1 and 5: no cable connection. However the jumper connection is necessary between #1 and 2 and #5 and 6 depending on the input specification.

MC-3030D, MC-DOUT Board (24P0117)

Connector #	Pin #	Signal name	Rod terminal to use	Connected cable
J1	1	24V_IN	AI 0.34-6 TQ (blue)	MC1.5-W-Lxxx
	2	24V_GND		
	3	MODBUS-A	AI 0.14-8 GY (gray)	
	4	MODBUS-B		
	5	GND		

Connector #	Pin #	Signal name	Rod terminal to use	Connected cable
J2	1	24V_OUT	AI 0.34-6 TQ (blue)	MC1.5-W-Lxxx
	2	24V_GND		
	3	MODBUS-A	AI 0.14-8 GY (gray)	
	4	MODBUS-B		
	5	GND		

Connector #	Pin #	Signal name	Rod terminal to use	Connected cable
J3	1	A1	AI 1-6 RD (red)	MPYC-12
	2	COM1		
	3	B1		
	4	A2		
	5	COM2		
	6	B2		

Connector #	Pin #	Signal name	Rod terminal to use	Connected cable
J4	1	A3	AI 1-6 RD (red)	MPYC-12
	2	COM3		
	3	B3		
	4	A4		
	5	COM4		
	6	B4		

Connector #	Pin #	Signal name	Rod terminal to use	Connected cable
J5	1	A5	AI 1-6 RD (red)	MPYC-12
	2	COM5		
	3	B5		
	4	A6		
	5	COM6		
	6	B6		

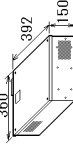
Connector #	Pin #	Signal name	Rod terminal to use	Connected cable
J6	1	A7	AI 1-6 RD (red)	MPYC-12
	2	COM7		
	3	B7		
	4	A8		
	5	COM8		
	6	B8		

PACKING LIST EC-3000



24AL-X-9851-8 1/1

NAME	OUTLINE	DESCRIPTION/CODE No.	Q' TY
------	---------	----------------------	-------



ユニット UNIT

制御部 PROCESSOR UNIT		EC-3000-* 000-020-737-00**	1
-----------------------	---	-------------------------------	---




予備品 SPARE PARTS

予備品 SPARE PARTS		SP24-00601 001-170-660-00	1 (*1)
予備品 SPARE PARTS		SP24-00602 001-170-670-00	1 (*1)

付属品 ACCESSORIES

付属品 ACCESSORIES		FP24-00601 001-170-660-00	1 (*2)
付属品 ACCESSORIES		FP24-00602 001-258-570-00	1 (*2)

工事材料 INSTALLATION MATERIALS OP24-02100






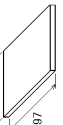
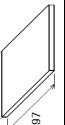
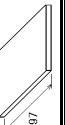
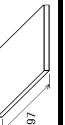
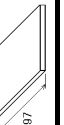
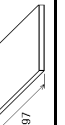
ケーブル(クミヒン) CABLE ASSEMBLY		DSJ50P-X2-L5M 000-176-663-11	1
工事材料 INSTALLATION MATERIALS		CP24-02101 001-170-630-00	1
電源ケーブル AC CABLE		IEG60320-C13-L5M 000-176-423-11	1

1.コード番号末尾の[*1]は、選択品の代表コードを表します。
CODE NUMBER ENDING WITH “*1” INDICATES THE CODE NUMBER OF REPRESENTATIVE MATERIAL.
2.(*1)(*2)(*3)(*4)(*5)は、それぞれ仕様選択品を表します。
(*1)(*2)(*3)(*4)(*5)INDICATE SPECIFICATION SELECTIVE ITEM.

(略図の寸法は、参考値です。 DIMENSIONS IN DRAWING FOR REFERENCE ONLY.)

NAME	OUTLINE	DESCRIPTION/CODE No.	Q' TY
------	---------	----------------------	-------

図書 DOCUMENT

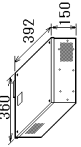





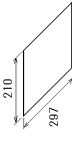

ドングルインフォメーションシート DONGLE INFORMATION SHEET			1 (*)
装備設定要領 INSTRUCTION MANUAL		999-999-085-0* *42-01204-* 000-177-029-1* **	1
取扱説明CD OPERATOR'S MANUAL CD		FMD3X00 O/M *CDROM*J 000-176-720-1*	1 (*3)
取扱説明CD OPERATOR'S MANUAL CD		FMD3X00 O/M *CDROM*E 000-176-721-1*	1 (*3)
取扱説明CD OPERATOR'S MANUAL CD		FPR2X9 O/M *CDROM*E 000-176-722-1*	1 (*3)
操作要領書 OPERATOR'S GUIDE		OS*-44730-* 000-176-127-1* **	1 (*4)
操作要領書 OPERATOR'S GUIDE		USE-36040-* 000-176-133-1*	1 (*4)
装備要領書 INSTALLATION MANUAL		IME-44730-* 000-176-129-1* **	1 (*5)
装備要領書 INSTALLATION MANUAL		IME-36040-* 000-176-135-1*	1 (*5)
装備要領書 INSTALLATION MANUAL		IME-36060-* 000-176-137-1*	1 (*5)
装備要領書 INSTALLATION MANUAL		IME-36100-* 000-176-139-1*	1 (*5)

3.(*1)は、ダミーコードに付き、注文できません。
(6) THIS CODE CANNOT BE ORDERED.

型式/コード番号が2段の場合、下段より上段に代わる通達製品であり、どちらが入っています。なお、品質は変わりません。
TWO TYPES AND CODES MAY BE LISTED FOR AN ITEM. THE LOWER PRODUCT MAY BE SHIPPED IN PLACE OF THE UPPER PRODUCT. QUALITY IS THE SAME.




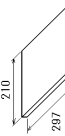




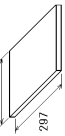
PACKING LIST EC-3000*V

24AL-X-9866-8 1/1

NAME	OUTLINE	DESCRIPTION/CODE No.	Q'TY
ユニット			
制御部 PROCESSOR UNIT		EC-3000-*	1
		000-020-737-00**	
付属品			
ACCESSORIES			
付属品 ACCESSORIES		FP24-00601	1
		001-170-660-00	(*)
付属品 ACCESSORIES		FP24-00602	1
		001-258-570-00	(*)
工事材料			
INSTALLATION MATERIALS			
CP24-02100			
ケーブル(クミビシ) CABLE ASSEMBLY		DSJB9P-X2-L5M	1
		000-176-663-11	
工事材料 INSTALLATION MATERIALS		CP24-02101	1
		001-170-630-00	
電源ケーブル AC CABLE		IEC60320-C13-L5M	1
		000-176-423-11	
図書			
DOCUMENT			
ドングルインフォメーションシート DONGLE INFORMATION SHEET			1
		999-999-085-0*	(*)
装備設定要領 INSTRUCTION MANUAL		*42-01204-*	1
		000-177-029-1**	**

1.コード番号末尾の[*]*は、選用品の代表コードを表します。
CODE NUMBER ENDING WITH “**” INDICATES THE CODE NUMBER OF REPRESENTATIVE MATERIAL.
2.(*1)(*2)(*3)(*4)は、それぞれ仕様選用品を表します。
(*1)(*2)(*3)(*4)INDICATE SPECIFICATION SELECTIVE ITEM.

(略図の寸法は、参考値です。 DIMENSIONS IN DRAWING FOR REFERENCE ONLY.)

NAME	OUTLINE	DESCRIPTION/CODE No.	Q' TY
取扱説明CD OPERATOR' S MANUAL CD		FMD3X00 O/M *CDROM*J	1
		000-176-720-1*	(*2)
取扱説明CD OPERATOR' S MANUAL CD		FMD3X00 O/M *CDROM*E	1
		000-176-721-1*	(*2)
取扱説明CD OPERATOR' S MANUAL CD		FOR2XX9 O/M *CDROM*E	1
		000-176-722-1*	(*2)
操作要領書 OPERATOR' S GUIDE		OS*-44730-*	1
		000-176-127-1*	(*3)
操作要領書 OPERATOR' S GUIDE		USE-36040-*	1
		000-176-133-1*	(*3)
装備要領書 INSTALLATION MANUAL		IME-44730-*	1
		000-176-129-1*	(*4)
装備要領書 INSTALLATION MANUAL		IME-36040-*	1
		000-176-135-1*	(*4)
装備要領書 INSTALLATION MANUAL		IME-36060-*	1
		000-176-137-1*	(*4)
装備要領書 INSTALLATION MANUAL		IME-36100-*	1
		000-176-139-1*	(*4)

3. (*)は、タミコードに付き、注文できません。
(*) THIS CODE CANNOT BE ORDERED.

型式/コード番号が2段の場合、下段より上段に代わる選用品であり、どちらが入っています。 なお、品質は変わりません。
TWO TYPES AND CODES MAY BE LISTED FOR AN ITEM. THE LOWER PRODUCT MAY BE SHIPPED IN PLACE OF THE UPPER PRODUCT. QUALITY IS THE SAME.

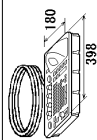



PACKING LIST

RGU-024-*

24AL-X-9854 -2

1/1

A-3

NAME	UNIT	OUTLINE	DESCRIPTION/CODE No.	Q'TY
ユニット				
ECD1S操作部	ECD1S CONTROL UNIT		RGU-024-*	1
			000-020-609-00 **	
付属品 ACCESSORIES				
付属品	ACCESSORIES		FP24-00701	1
			001-170-820-00	
工事材料 INSTALLATION MATERIALS				
ケーブル (ケビシ) USB	CABLE ASSEMBLY		TS-20-071-1 L=5000	1
			000-176-700-11	
工事材料	INSTALLATION MATERIALS		CP24-02201	1
			001-170-810-00	

コード番号末尾の[**]は、選択品の代表コードを表します。
CODE NUMBER ENDING WITH " **" INDICATES THE CODE NUMBER OF REPRESENTATIVE MATERIAL

型式コード番号が2段の場合、下段より上段に代わる過渡期品であり、どちらが入っています。なお、品質は変わりません。
TWO TYPES AND CODES MAY BE LISTED FOR AN ITEM. THE LOWER PRODUCT MAY BE SHIPPED IN PLACE OF THE UPPER PRODUCT. QUALITY IS THE SAME.

（略図の寸法は、参考値です。 DIMENSIONS IN DRAWING FOR REFERENCE ONLY.）

C4473-Z02-C

コード番号末尾の[**]は、選択品の代表コードを表します。
CODE NUMBER ENDING WITH “**” INDICATES THE CODE NUMBER OF REPRESENTATIVE MATERIAL

型式/コード番号が2段の場合、下段より上段に代わる過渡期品であり、どちらが入っています。なお、品質は変わりません。
TWO TYPES AND CODES MAY BE LISTED FOR AN ITEM. THE LOWER PRODUCT MAY BE SHIPPED IN PLACE OF THE UPPER PRODUCT. QUALITY IS THE SAME.
(略図の寸法は、参考値です。 DIMENSIONS IN DRAWING FOR REFERENCE ONLY.)

C4473-Z02-C

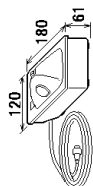



PACKING LIST

RCU-026-*

24AL-X-9856 -2

1/1

A-4

NAME		OUTLINE	DESCRIPTION/CODE No.	Q'TY
ユニット				
トラックボール操作部		RCU-026-*	1	
TRACKBALL CONTROL UNIT		000-020-619-00 **		
付属品 ACCESSORIES				
付属品		FP24-00801	1	
ACCESSORIES		001-170-920-00		
工事材料 INSTALLATION MATERIALS				
ケーブル (ケビシ) USB		TS-20-071-1 L=5000	1	
CABLE ASSEMBLY		000-176-700-11		
工事材料		CP24-02301	1	
INSTALLATION MATERIALS		001-170-910-00		

コード番号末尾の「**」は、選択品の代表コードを表します。
CODE NUMBER ENDING WITH “**” INDICATES THE CODE NUMBER OF REPRESENTATIVE MATERIAL.

型式「コード」番号が2段の場合、下段より上段に代わる過渡期品であり、どちらが入っています。なお、品質は変わりません。
TWO TYPES AND CODES MAY BE LISTED FOR AN ITEM. THE LOWER PRODUCT MAY BE SHIPPED IN PLACE OF THE UPPER PRODUCT. QUALITY IS THE SAME.

(略図の寸法は、参考値です。 DIMENSIONS IN DRAWING FOR REFERENCE ONLY.)

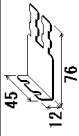

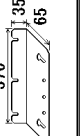
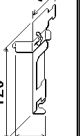
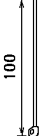
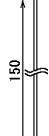
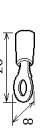
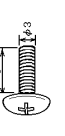
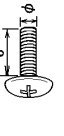
C4473-Z04-C

コード番号末尾の[**]は、選択品の代表コードを表します。
CODE NUMBER ENDING WITH “**” INDICATES THE CODE NUMBER OF REPRESENTATIVE MATERIAL

型式/コード番号が2段の場合、下段より上段に代わる過渡期品であり、どちらが入っています。なお、品質は変わりません。
TWO TYPES AND CODES MAY BE LISTED FOR AN ITEM. THE LOWER PRODUCT MAY BE SHIPPED IN PLACE OF THE UPPER PRODUCT. QUALITY IS THE SAME.
(略図の寸法は、参考値です。 DIMENSIONS IN DRAWING FOR REFERENCE ONLY.)

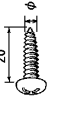
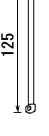
C4473-Z04-C

CODE NO.	001-170-630-00	24AL-X-9401-2
TYPE	CP24-02101	1/1

工事材料表							
INSTALLATION MATERIALS							
番号 NO.	名 称 NAME	略 図 OUTLINE	型名／規格 DESCRIPTIONS	数量 Q'TY	用途／備考 REMARKS		
1	配線板1 WIRING PLATE 1		24-014-0104-2	1			
			CODE NO. 100-366-812-10				
2	筐体足1 CHASSIS BASE 1		24-014-0121-1	1			
			CODE NO. 100-367-721-10				
3	筐体足2 CHASSIS BASE 2		24-014-0122-1	1			
			CODE NO. 100-372-171-10				
4	配線板2組立品 WIRING PLATE 2 ASSY		CP24-02102	1			
			CODE NO. 001-186-200-00				
5	ケーブルツル CABLE TIE		CV-100M	10			
			CODE NO. 000-162-167-10				
6	ケーブルツル CABLE TIE		CV-150M	30			
			CODE NO. 000-162-186-10				
7	圧着端子 CRIMP-ON LUG		FV1.25-4(LF) RED	9			
			CODE NO. 000-166-666-10				
8	+ハインドネジ BINDING HEAD SCREW		M3X6 SUS304	5			
			CODE NO. 000-162-664-10				
9	+ハインドネジ BINDING HEAD SCREW		M4X8 SUS304	10			
			CODE NO. 000-162-669-10				

型式/コード番号が2段の場合、下段より上段に代わる選装部品であり、どちらが入っています。なお、品質は変わりません。
TWO TYPES AND CODES MAY BE LISTED FOR AN ITEM. THE LOWER PRODUCT MAY BE SHIPPED IN PLACE OF THE UPPER PRODUCT.
QUALITY IS THE SAME.
(略図の寸法は、参考値です。 DIMENSIONS IN DRAWING FOR REFERENCE ONLY.)

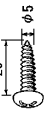
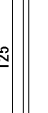
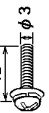
CODE NO.	001-170-810-00	24AL-X-9402-2
TYPE	CP24-02201	1/1

工事材料表							
INSTALLATION MATERIALS							
番号 NO.	名 称 NAME	略 図 OUTLINE	型名／規格 DESCRIPTIONS	数量 Q'TY	用途／備考 REMARKS		
1	+5789ネジ SELF-TAPPING SCREW		5X20 SUS304	2			
			CODE NO. 000-162-608-10				
2	凸ネツル CONVEX		CV-125M	2			
			CODE NO. 000-172-164-10				

型式/コード番号が2段の場合、下段より上段に代わる選装部品であり、どちらが入っています。なお、品質は変わりません。
TWO TYPES AND CODES MAY BE LISTED FOR AN ITEM. THE LOWER PRODUCT MAY BE SHIPPED IN PLACE OF THE UPPER PRODUCT.
QUALITY IS THE SAME.
(略図の寸法は、参考値です。 DIMENSIONS IN DRAWING FOR REFERENCE ONLY.)

CODE NO.	001-170-910-00	24AL-X-9403-2
TYPE	CP24-02301	

1/1

工事材料表					
INSTALLATION MATERIALS					
番号 NO.	名称 NAME	略図 OUTLINE	型名／規格 DESCRIPTIONS	数量 Q'TY	用途／備考 REMARKS
1	+self-tapping screw SELF-TAPPING SCREW		5X20 SUS304 CODE NO. 000-162-608-10	2	
2	convex CONVEX		CV-125M CODE NO. 000-172-164-10	2	
3	washer head screw WASHER HEAD SCREW		M3X12 SUS304 CODE NO. 000-162-648-10	4	


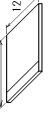
型式/コード番号が2段の場合、下段より上段に代わる通達部品であり、どちらかが入っています。なお、品質は変わりません。
TWO TYPES AND CODES MAY BE LISTED FOR AN ITEM. THE LOWER PRODUCT MAY BE SHIPPED IN PLACE OF THE UPPER PRODUCT.
QUALITY IS THE SAME.
(略図の寸法は、参考値です。 DIMENSIONS IN DRAWING FOR REFERENCE ONLY.)

FURUNO ELECTRIC CO., LTD.

C4473-M03-C

CODE NO.	001-258-570-00	24AL-X-9509-0
TYPE	FP24-00602	

1/1

付属品表					
ACCESSORIES					
番号 NO.	名称 NAME	略図 OUTLINE	型名／規格 DESCRIPTIONS	数量 Q'TY	用途／備考 REMARKS
1	防塵スポンジ DUST-PROOF SPONGE		24-014-0105-1 CODE NO. 100-366-821-10	1	
2	DVD-R書込み品 ACCESSORIES		2450110- CODE NO. 001-258-5580-00	1	



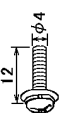
型式/コード番号が2段の場合、下段より上段に代わる通達部品であり、どちらかが入っています。なお、品質は変わりません。
TWO TYPES AND CODES MAY BE LISTED FOR AN ITEM. THE LOWER PRODUCT MAY BE SHIPPED IN PLACE OF THE UPPER PRODUCT.
QUALITY IS THE SAME.
(略図の寸法は、参考値です。 DIMENSIONS IN DRAWING FOR REFERENCE ONLY.)

FURUNO ELECTRIC CO., LTD.

C4473-F08-A

CODE NO.	001-170-820-00	24AL-X-9501-0
TYPE	FP24-00701	

1/1

付属品表			ACCESSORIES			
番号 NO.	名 称 NAME	略 図 OUTLINE	型名／規格 DESCRIPTIONS	数量 Q'TY	用途／備考 REMARKS	
1	卓上取付板 DESK FIXING PLATE		24-014-1401-0 CODE NO. 100-367-460-10	1		
2	USBシート USB SHEET		24-014-1411-0 CODE NO. 100-372-500-10	1		
3	ナット&ワッシャー WASHER HEAD SCREW *8*		M4X12 C2700W MBN12 CODE NO. 000-163-192-10	4		




型式/コード番号が2段の場合、下段より上段に代わる選定製品であり、どちらが入っています。なお、品質は変わりません。
TWO TYPES AND CODES MAY BE LISTED FOR AN ITEM. THE LOWER PRODUCT MAY BE SHIPPED IN PLACE OF THE UPPER PRODUCT.
QUALITY IS THE SAME.
(略図の寸法は、参考値です。 DIMENSIONS IN DRAWING FOR REFERENCE ONLY.)

FURUNO ELECTRIC CO., LTD.

C4473-F01-A

CODE NO.	001-170-920-00	24AL-X-9502-0
TYPE	FP24-00801	

1/1

付属品表		ACCESSORIES				
番 号 NO.	名 称 NAME	略 図 OUTLINE	型 名 / 規 格 DESCRIPTIONS	数 量 Q'TY	用 途 / 備 考 REMARKS	
1	卓上取付板 DESKTOP FIXING PLATE		14-078-2311-0 CODE NO. 100-364-730-10	1		
2	USBシート USB SHEET		24-014-1411-0 CODE NO. 100-372-500-10	1		
3	+T+、tL2B WASHER HEAD SCREW +8*		M3X8 SUS304 CODE NO. 100-162-649-10	2		

型式/コード番号が2段の場合、下段より上段に代わる選定製品であり、どちらが入っています。なお、品質は変わりません。
TWO TYPES AND CODES MAY BE LISTED FOR AN ITEM. THE LOWER PRODUCT MAY BE SHIPPED IN PLACE OF THE UPPER PRODUCT.
QUALITY IS THE SAME.
(略図の寸法は、参考値です。 DIMENSIONS IN DRAWING FOR REFERENCE ONLY.)

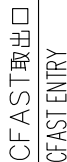
FURUNO ELECTRIC CO., LTD.

C4473-F02-A

FURUNO

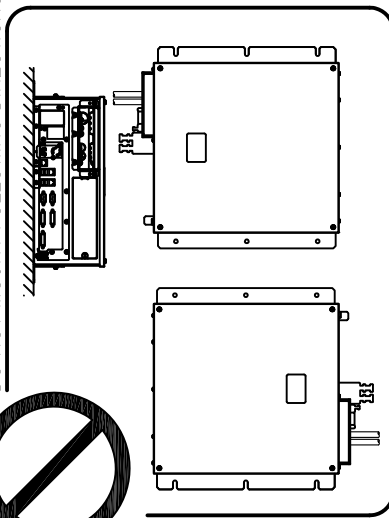
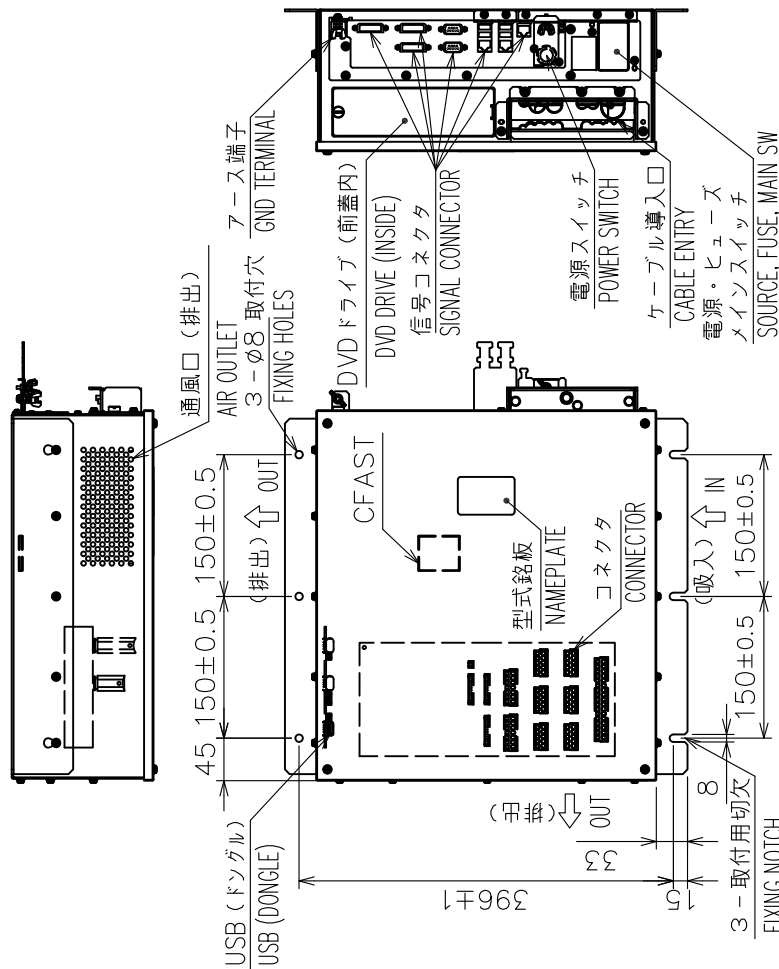
SHIP NO.		SPARE PARTS LIST FOR		U S E		CODE NO.		24AL-X-9301 -I 1/1	
						TYPE		BOX NO. P	
						SP24-00601			

公差 (mm) TOLERANCE	寸法区分 (mm) DIMENSION
±1.5	L ≤ 50
±2.5	50 < L ≤ 100
±3	100 < L ≤ 500



背面 (尺度: 1/12)

REAR VIEW (SCALE: 1/12)



下図の向きでは取付けできません
DO NOT MOUNT FOLLOWING DIRECTIONS

品
共

- 1) 指定外の寸法公差は表1による。
- 2) #印寸法は最小サービスク間寸法とする。
- 3) 取付用ネジはM6ボルトまたはコーチボルト呼び径6を使用のこと。
- 4) D V D ドライブの向きは左右いずれかとする。切欠きが下向きとなるよう取付金具（工材）を本体に取り付ける。

NOTE

1. TABLE 1 INDICATES TOLERANCE OF DIMENSIONS WHICH IS NOT SPECIFIED.
2. #: MINIMUM SERVICE CLEARANCE.
3. USE M6 BOLTS OR COACH SCREWS $\phi 6$ FOR FIXING THE UNIT.
4. FACE THE DVD DRIVE TO RIGHT OR LEFT SIDE EITHER. MOUNT THE FIXING PLATES (SUPPLIED) TO THE CHASSIS AS THE FIXING NOTCH FACES TO BOTTOM.

DRAWN	13/Feb/2014	T. YAMASAKI			TITLE	EC-3000
CHECKED	13/Feb/2014	H. MAKI			名称	制御部（壁掛装備）
APPROVED	13/Feb/2014	H. MAKI			外寸図	
SCALE	1/8	1/4	1/16	1/32	NAME	PROCESSOR UNIT (BULKHEAD MOUNT)
DWG.No.	C4473-G01-C		REF.No.		24-014-0116-2	
OUTLINE DRAWING						

電源・信号ケーブル (5 m)

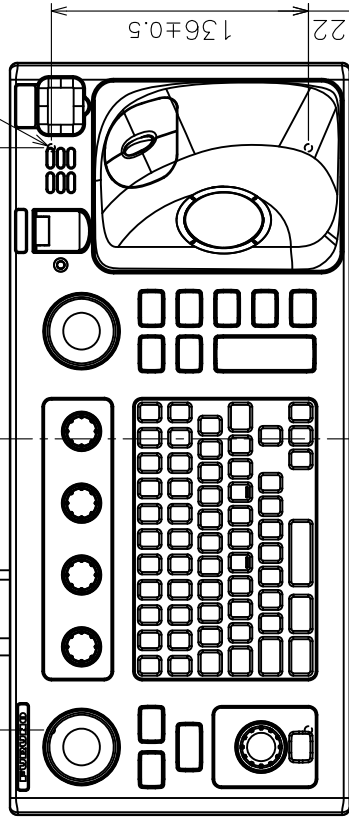
POWER/SIGNAL CABLE

USBケーブル

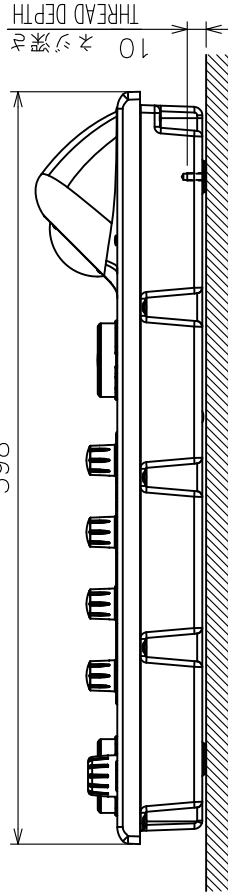
USB CABLE

308±0.5

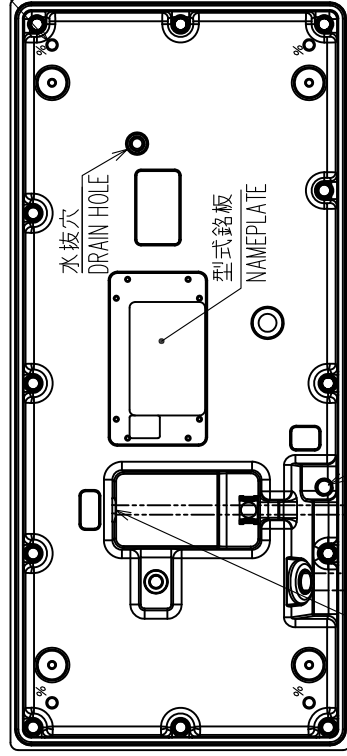
取付穴
4-M4
FIXING HOLES



398



4-M4 水抜穴
DRAIN HOLES

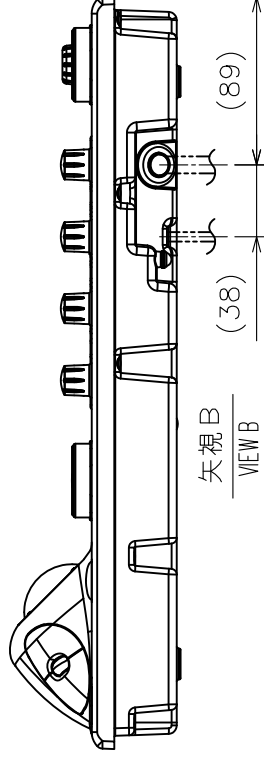


信号コネクタ
SIGNAL CONNECTOR

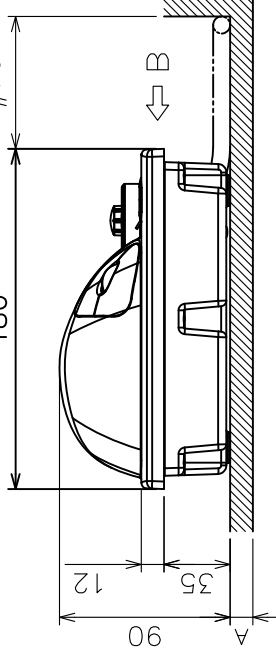
アース端子
GND TERMINAL

表1 TABLE 1

寸法区分 (mm) DIMENSION	公差 (mm) TOLERANCE
$L \leq 50$	± 1.5
$50 < L \leq 100$	± 2.5
$100 < L \leq 500$	± 3



矢視 B
VIEW B



注記

- 1) 指定外の寸法公差は表 1 による。
- 2) # 印寸法は最小サージス空間寸法とする。
- 3) 取付ネジはセムスネジ B M4×12 を使用のこと。
壁の厚さ (A) は最小 2 mm、最大 4 mm とする。
それ以外の場合は、M4×(A (壁の厚さ) + 8±2 mm) とする。

NOTE 1. TABLE 1 INDICATES TOLERANCE OF DIMENSIONS WHICH IS NOT SPECIFIED.

2. # MINIMUM SERVICE CLEARANCE.

3. USE SEMS B SCREWS (M4x12) FOR BULKHEAD THICKNESS(A): $2 \leq A \leq 4$
OR SCREW LENGTH: $A+8 \pm 2$.

DRAWN	6/Jan/2012	T.YAMASAKI	TITLE	RCU-024
CHECKED	6/Jan/2012	H.MAKI	名称	ECDIS 操作部 (卓上装備)
APPROVED			外寸図	
SCALE	1/4	WASS 3.0	質量は 5 m ケーブルを含む。 MASS INCLUDES 5m CABLE.	ECDIS CONTROL UNIT (TABLETOP MOUNT)
DWG.No.	C4473-G02-B	REF.No.	24-014-100G-2	OUTLINE DRAWING

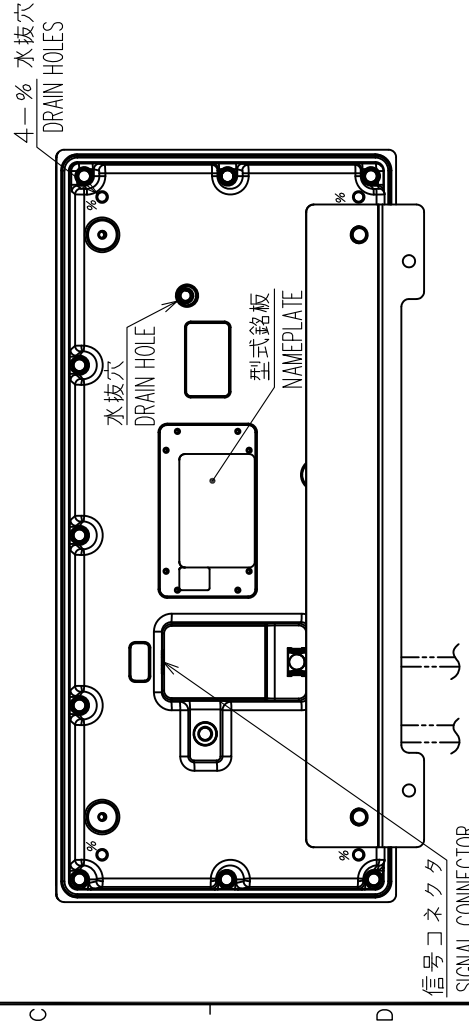
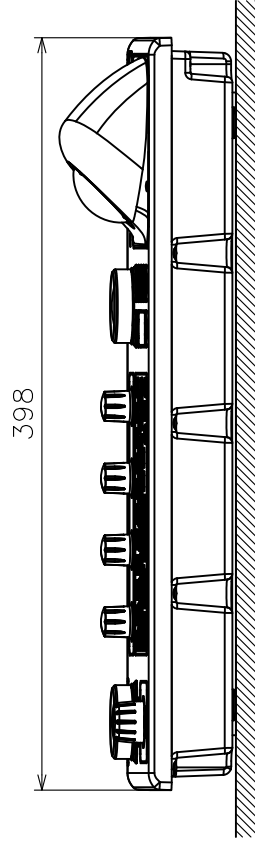
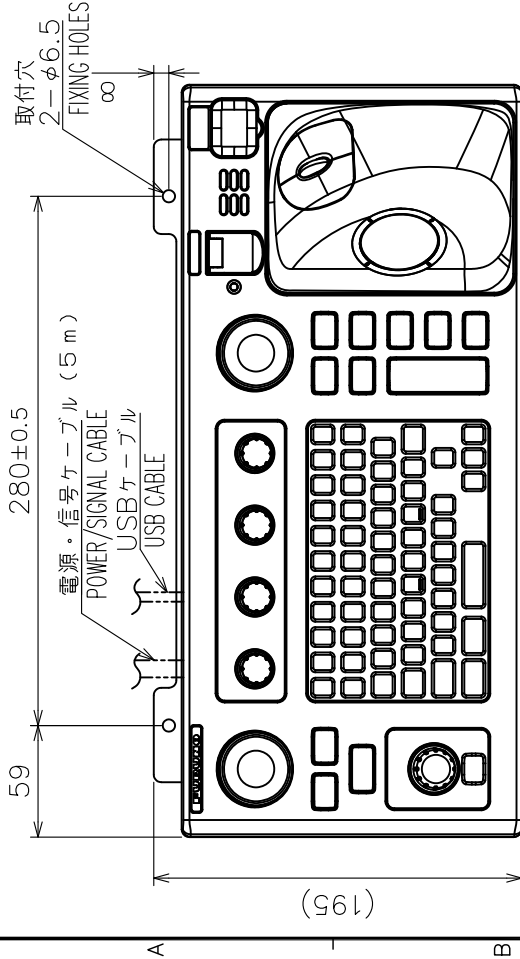
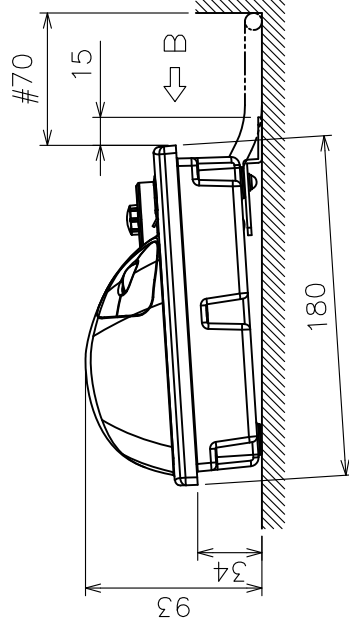
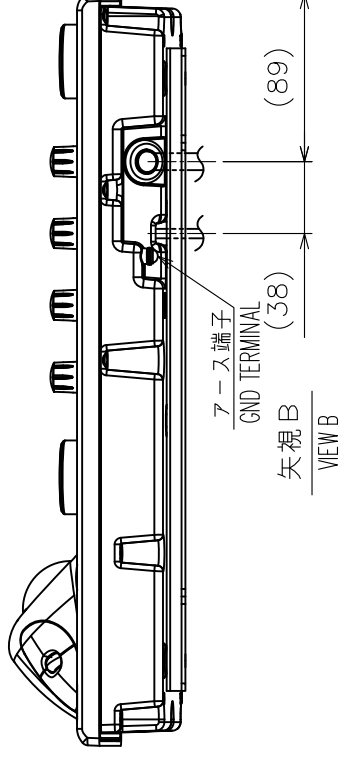


表1 TABLE 1

寸法区分 (mm) DIMENSION	公差 (mm) TOLERANCE
L ≤ 50	±1.5
50 < L ≤ 100	±2.5
100 < L ≤ 500	±3



注 記 1) 指定外の寸法公差は表 1 による。

2) # 印寸法は最小サービスペース寸法とする。

3) 取付ネジはトラスタップピンネジ呼び径 5 × 2.0 を使用のこと。

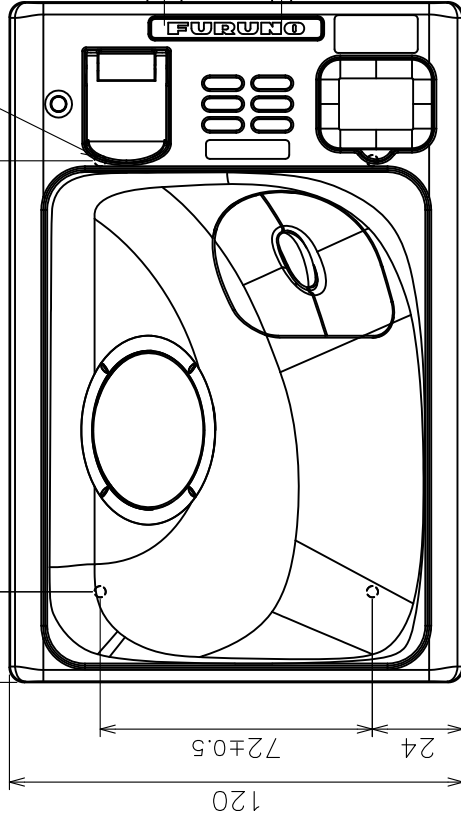
NOTE 1. TABLE 1 INDICATES TOLERANCE OF DIMENSIONS WHICH IS NOT SPECIFIED.

2. # MINIMUM SERVICE CLEARANCE.

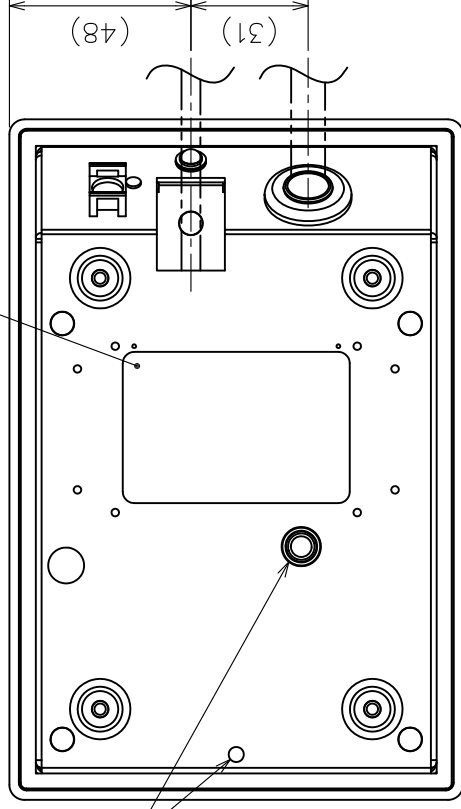
3. USE TAPPING SCREWS φ5x2.0 FOR FIXING THE UNIT.

DRAWN	5/Nov/2012	T.YAMASAKI	TITLE	RCU-024
CHECKED	5/Nov/2012	H.MAKI	名称	ECDIS 操作部 (取付金具)
APPROVED			外寸図	
SCALE	1/4	WASS 3.3	質量は 5m ケーブルを含む。 MASS INCLUDES 5m CABLE.	ECDIS CONTROL UNIT (FIXTURE MOUNT)
DWG.No.	C4473-G04-B	REF.No.	24-014-120G-2	OUTLINE DRAWING

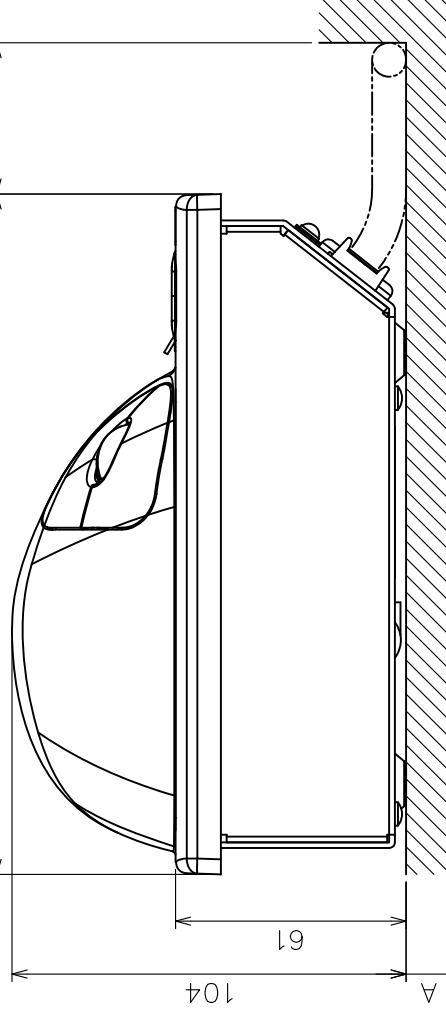
114±0.5
24
FIXING HOLES
4-M3 取付穴



型式銘板
NAMEPLATE



180
#40



底面図
BOTTOM VIEW

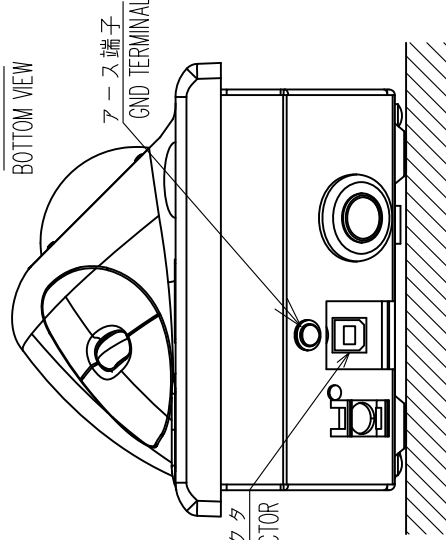
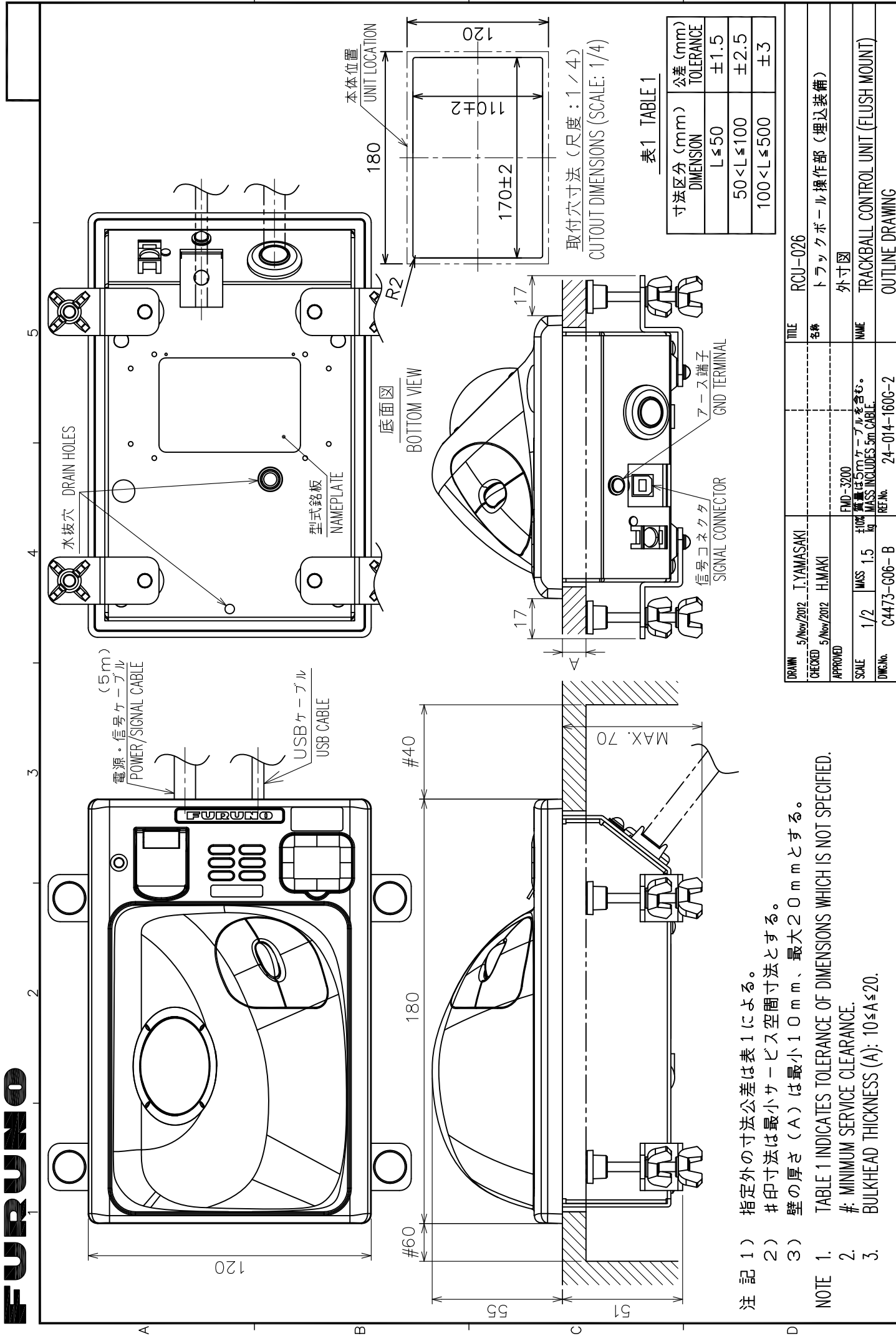


表1 TABLE 1

寸法区分 (mm) DIMENSION	公差 (mm) TOLERANCE
L ≤ 50	±1.5
50 < L ≤ 100	±2.5
100 < L ≤ 500	±3

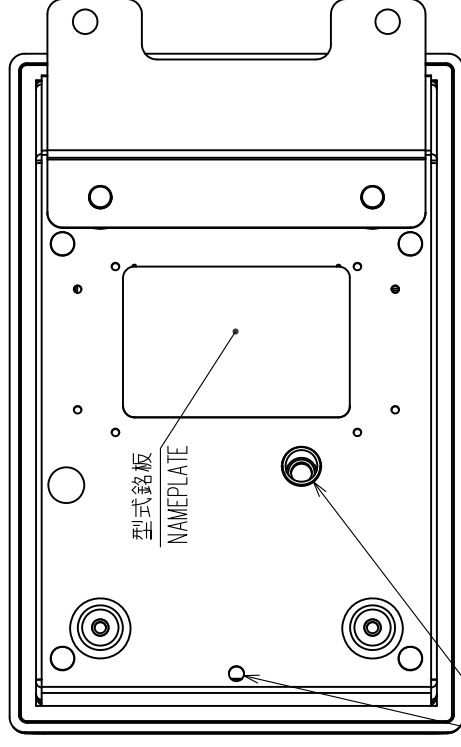
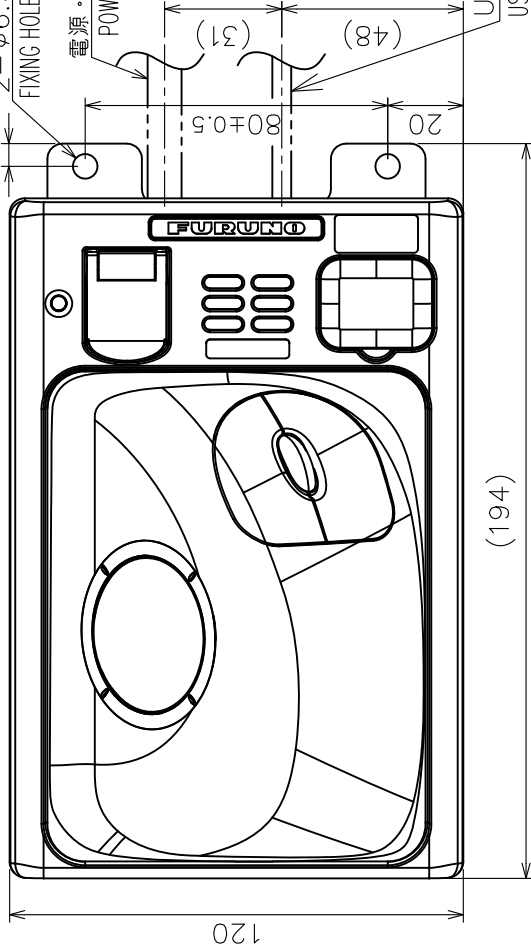
- 注記 1) 指定外の寸法公差は表1による。
2) #印寸法は最小サービス空間寸法とする。
3) 取付ネジはセムスネジB M3×12を使用のこと。壁の厚さ(A)は最小2、最大4とする。それ以外はねじ長さをA+8±2とする。
- NOTE 1. TABLE 1 INDICATES TOLERANCE OF DIMENSIONS WHICH IS NOT SPECIFIED.
2. #: MINIMUM SERVICE CLEARANCE.
3. USE SEMS B SCREWS M3x12 FOR BULKHEAD THICKNESS (A): 2 ≤ A ≤ 4. OR SCREW LENGTH: A+8±2.

DRAWN	5/Nov/2012	T.YAMASAKI	TITLE	RCU-026
CHECKED	5/Nov/2012	H.MAKI	名称	トラックボール操作部 (卓上装備)
APPROVED			外寸図	
SCALE	1/2	WASS 1.4	質量は5mケーブルを含む。 MASS INCLUDES 5m CABLE.	
DMC No.	C4473-G05-B	REF No.	24-014-150G-2	
			NAME	TRACKBALL CONTROL UNIT (TABLETOP MOUNT)
				OUTLINE DRAWING



- 注記 1) 指定外の寸法公差は表 1 による。
 2) # 印寸法は最小サービス空間寸法とする。
 3) 壁の厚さ (A) は最小 10 mm、最大 20 mm とする。
- NOTE 1. TABLE 1 INDICATES TOLERANCE OF DIMENSIONS WHICH IS NOT SPECIFIED.
 2. #: MINIMUM SERVICE CLEARANCE.
 3. BULKHEAD THICKNESS (A): 10 ≤ A ≤ 20.

2-φ6.5 取付穴
FIXING HOLES
電源・信号ケーブル (5m)
POWER/SIGNAL CABLE



底面図
BOTTOM VIEW

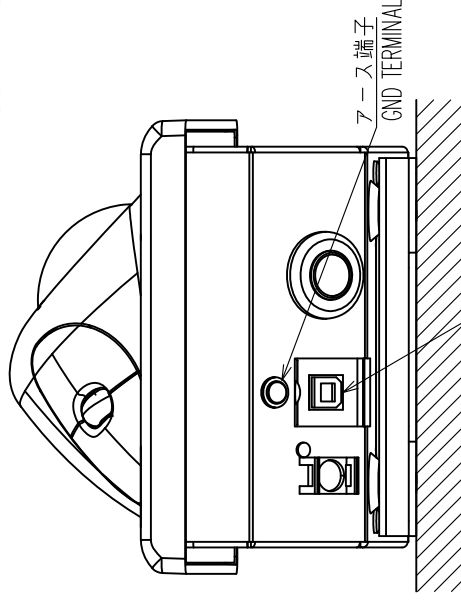
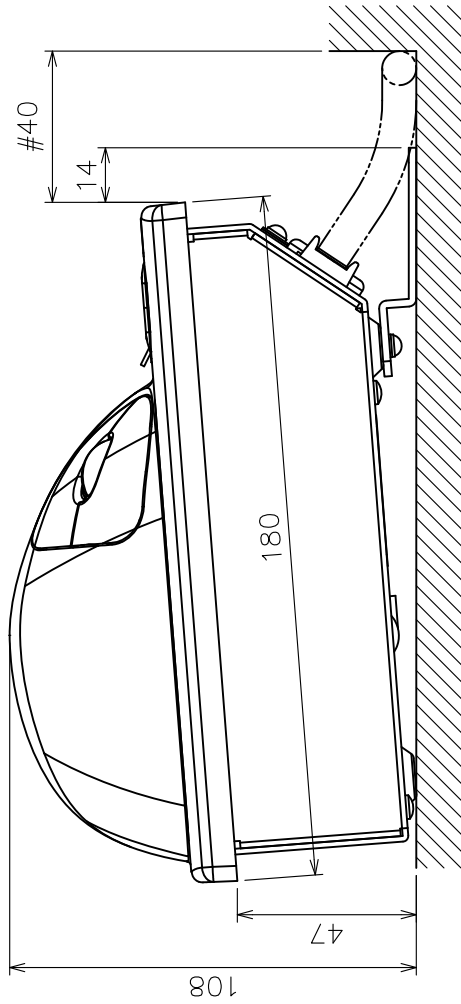


表1 TABLE 1

寸法区分 (mm) DIMENSION	公差 (mm) TOLERANCE
L ≤ 50	±1.5
50 < L ≤ 100	±2.5
100 < L ≤ 500	±3

- 注 記
- 1) 指定外の寸法公差は表 1 による。
 - 2) #印寸法は最小サービス空間寸法とする。
 - 3) 取付ネジはトラスタッピンネジ呼び径5×20を使用のこと。
- NOTE
1. TABLE 1 INDICATES TOLERANCE OF DIMENSIONS WHICH IS NOT SPECIFIED.
 2. #: MINIMUM SERVICE CLEARANCE.
 3. USE TAPPING SCREWS φ5x20 FOR FIXING THE UNIT.

DRAWN	5/Nov/2012	T.YAMASAKI	TITLE	RCU-026
CHECKED	5/Nov/2012	H.IMAKI	名称	トラックボール操作部 (取付金具)
APPROVED			外寸図	
SCALE	1/2	WASS 1.5	FMD-3200	質量は5mケーブルを含む。 MASS INCLUDES 5m CABLE.
DMC No.	C4473-G07-B	REF No.	24-014-170G-2	TRACKBALL CONTROL UNIT (FIXTURE MOUNT)
				OUTLINE DRAWING

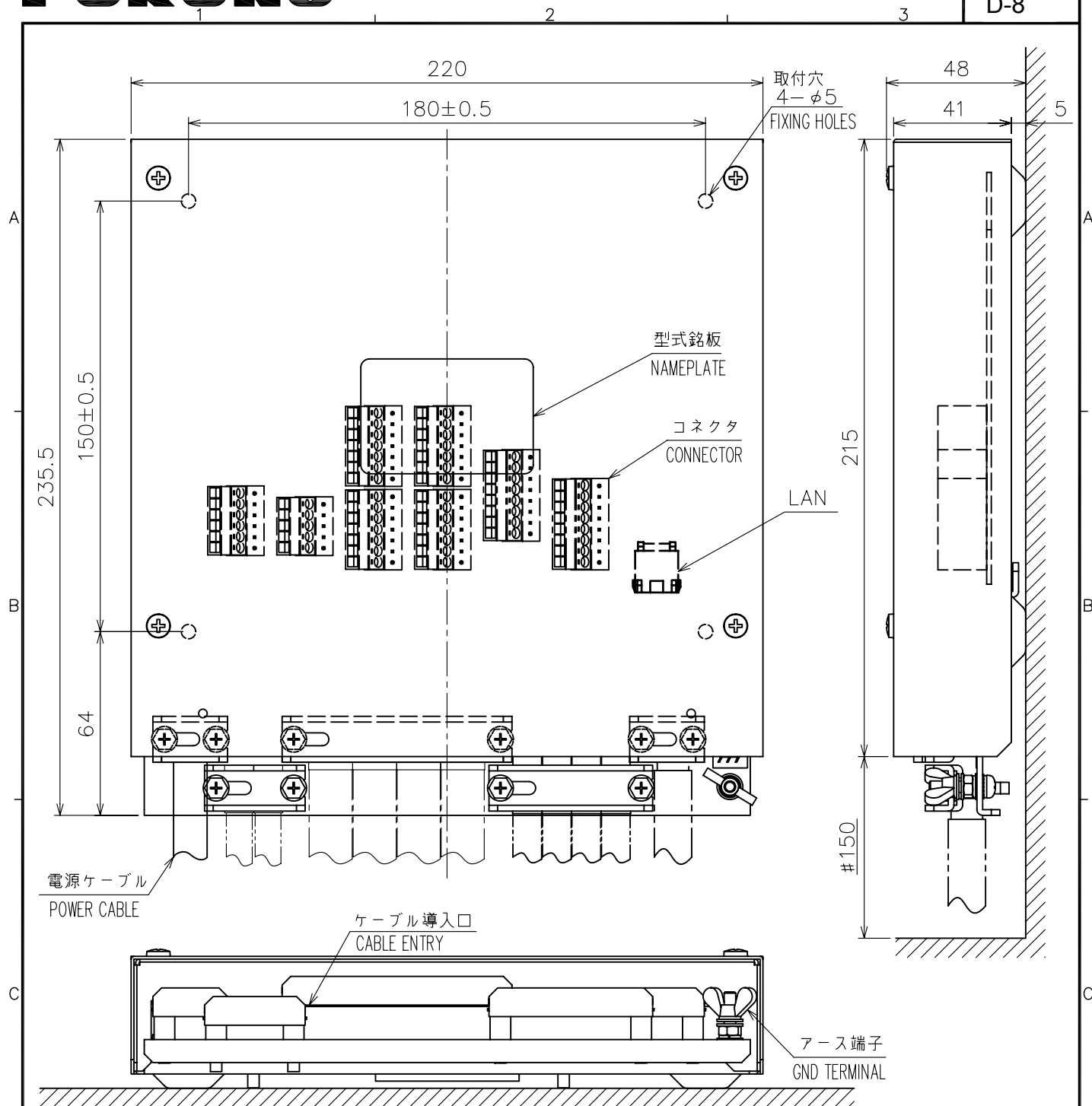


表1 TABLE 1

寸法区分 (mm) DIMENSION	公差 (mm) TOLERANCE
L ≤ 50	±1.5
50 < L ≤ 100	±2.5
100 < L ≤ 500	±3

- 注 記
- 1) 指定外の寸法公差は表 1 による。
 - 2) # 印寸法は最小サービス空間寸法とする。
 - 3) 取付用ネジはトラスタッピンネジ呼び径 4×20 を使用のこと。

- NOTE
1. TABLE 1 INDICATES TOLERANCE OF DIMENSIONS WHICH IS NOT SPECIFIED.
 2. #: MINIMUM SERVICE CLEARANCE.
 3. USE TAPPING SCREWS Ø4x20 FOR FIXING THE UNIT.

DRAWN	11/Jan/2012 T.YAMASAKI	TITLE	MC-3000S
CHECKED	11/Jan/2012 H.MAKI	名称	センサアダプター (シリアル)
APPROVED	13/Jan/2012 Y.NISHIYAMA	外寸図	
SCALE	1/2	MASS	1.5 ±10% kg
DWG. No.	C4473-G08- A	REF. No.	24-014-200G-1
		質量はケーブルを含まず。 MASS DOES NOT INCLUDE CABLE.	NAME
			SENSOR ADAPTER (SERIAL)
			OUTLINE DRAWING

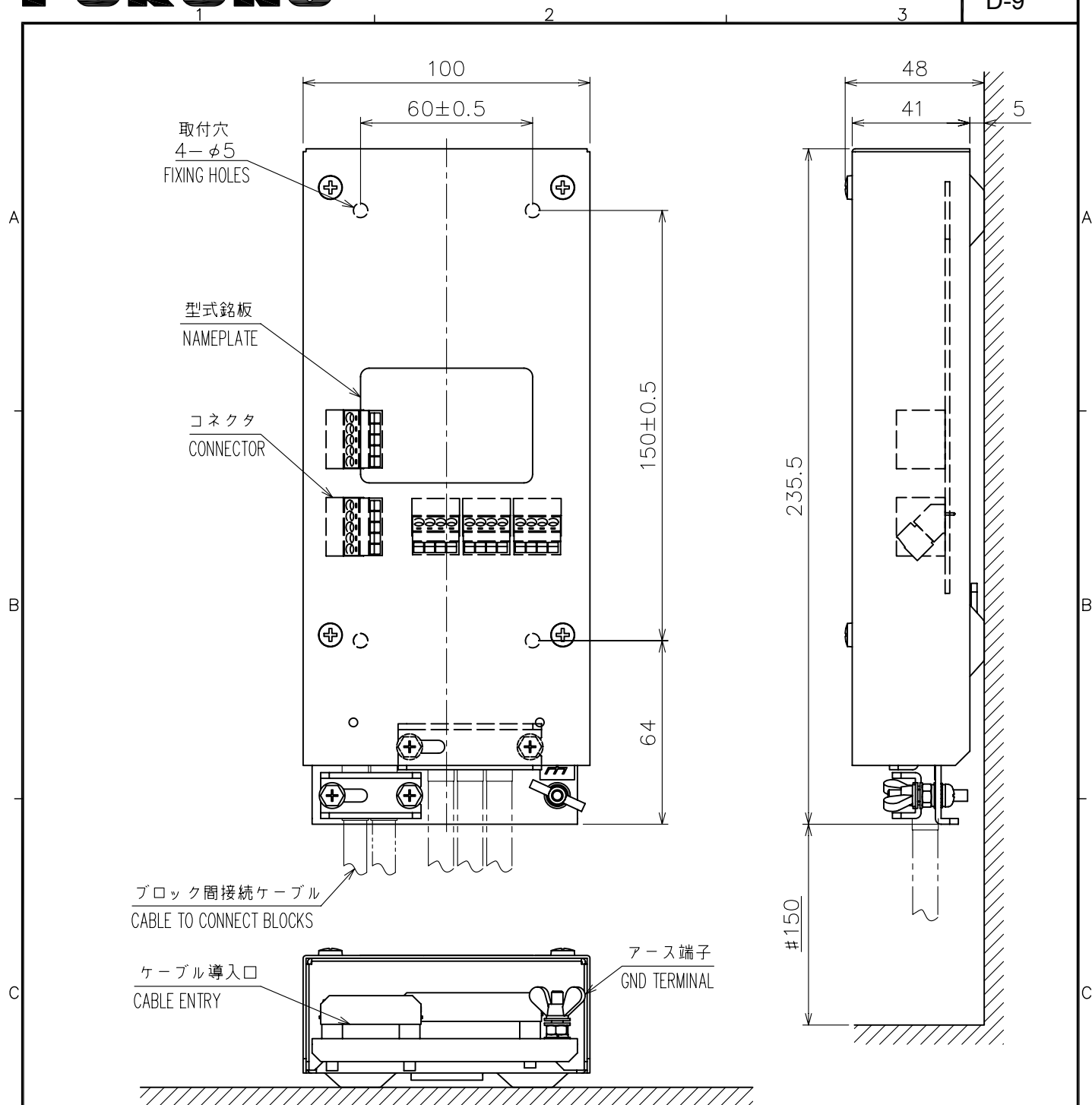


表1 TABLE 1

寸法区分 (mm) DIMENSION	公差 (mm) TOLERANCE
$L \leq 50$	± 1.5
$50 < L \leq 100$	± 2.5
$100 < L \leq 500$	± 3

- 注 記
- 1) 指定外の寸法公差は表 1 による。
 - 2) # 印寸法は最小サービス空間寸法とする。
 - 3) 取付用ネジはトラスタップピンネジ呼び径 4×20 を使用のこと。

- NOTE
1. TABLE 1 INDICATES TOLERANCE OF DIMENSIONS WHICH IS NOT SPECIFIED.
 2. # MINIMUM SERVICE CLEARANCE.
 3. USE TAPPING SCREWS $\phi 4 \times 20$ FOR FIXING THE UNIT.

DRAWN	11/Jan/2012 T.YAMASAKI	TITLE	MC-3010A
CHECKED	11/Jan/2012 H.MAKI	名称	センサアダプター (アナログ)
APPROVED	13/Jan/2012 Y.NISHIYAMA	外寸図	
SCALE	1/2	MASS	0.8 $\pm 10\%$ kg
DWG. No.	C4473-G09-A	REF. No.	24-014-210G-1
		質量はケーブルを含まず。 MASS DOES NOT INCLUDE CABLE.	NAME
			SENSOR ADAPTER (ANALOG)
			OUTLINE DRAWING

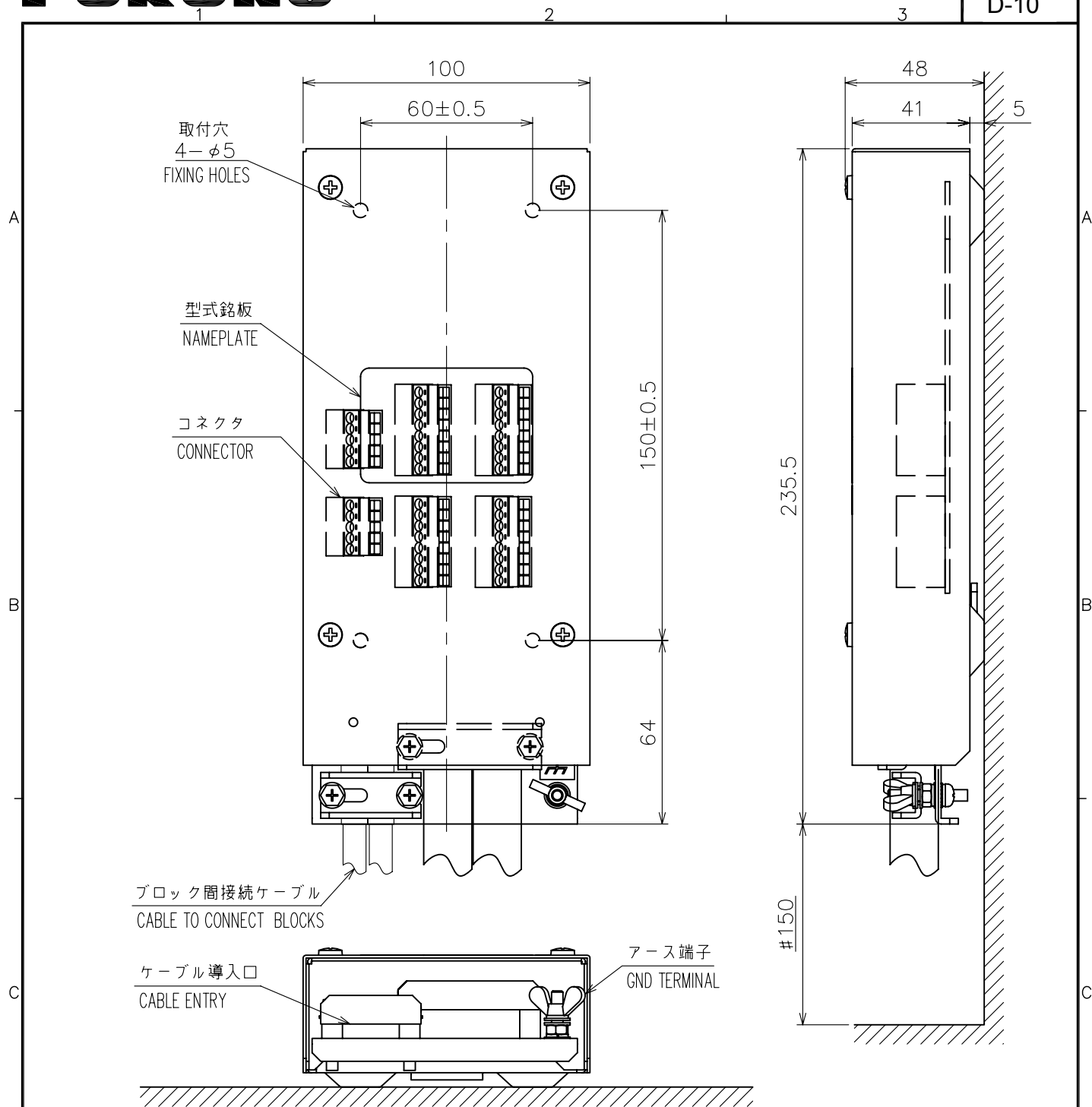


表1 TABLE 1

寸法区分 (mm) DIMENSION	公差 (mm) TOLERANCE
$L \leq 50$	± 1.5
$50 < L \leq 100$	± 2.5
$100 < L \leq 500$	± 3

- 注 記
- 1) 指定外の寸法公差は表 1 による。
 - 2) # 印寸法は最小サービス空間寸法とする。
 - 3) 取付用ネジはトラスタップピンネジ呼び径 4×20 を使用のこと。

- NOTE
1. TABLE 1 INDICATES TOLERANCE OF DIMENSIONS WHICH IS NOT SPECIFIED.
 2. #: MINIMUM SERVICE CLEARANCE.
 3. USE TAPPING SCREWS $\phi 4 \times 20$ FOR FIXING THE UNIT.

DRAWN	11/Jan/2012	T.YAMASAKI	TITLE	MC-3020D
CHECKED	11/Jan/2012	H.MAKI	名称	センサアダプター (デジタルイン)
APPROVED	13/Jan/2012	Y.NISHIYAMA	外寸図	
SCALE	1/2	MASS	質量はケーブルを含まず。 MASS DOES NOT INCLUDE CABLE.	NAME
DWG. No.	C4473-G10-A	REF. No.	24-014-220G-1	OUTLINE DRAWING

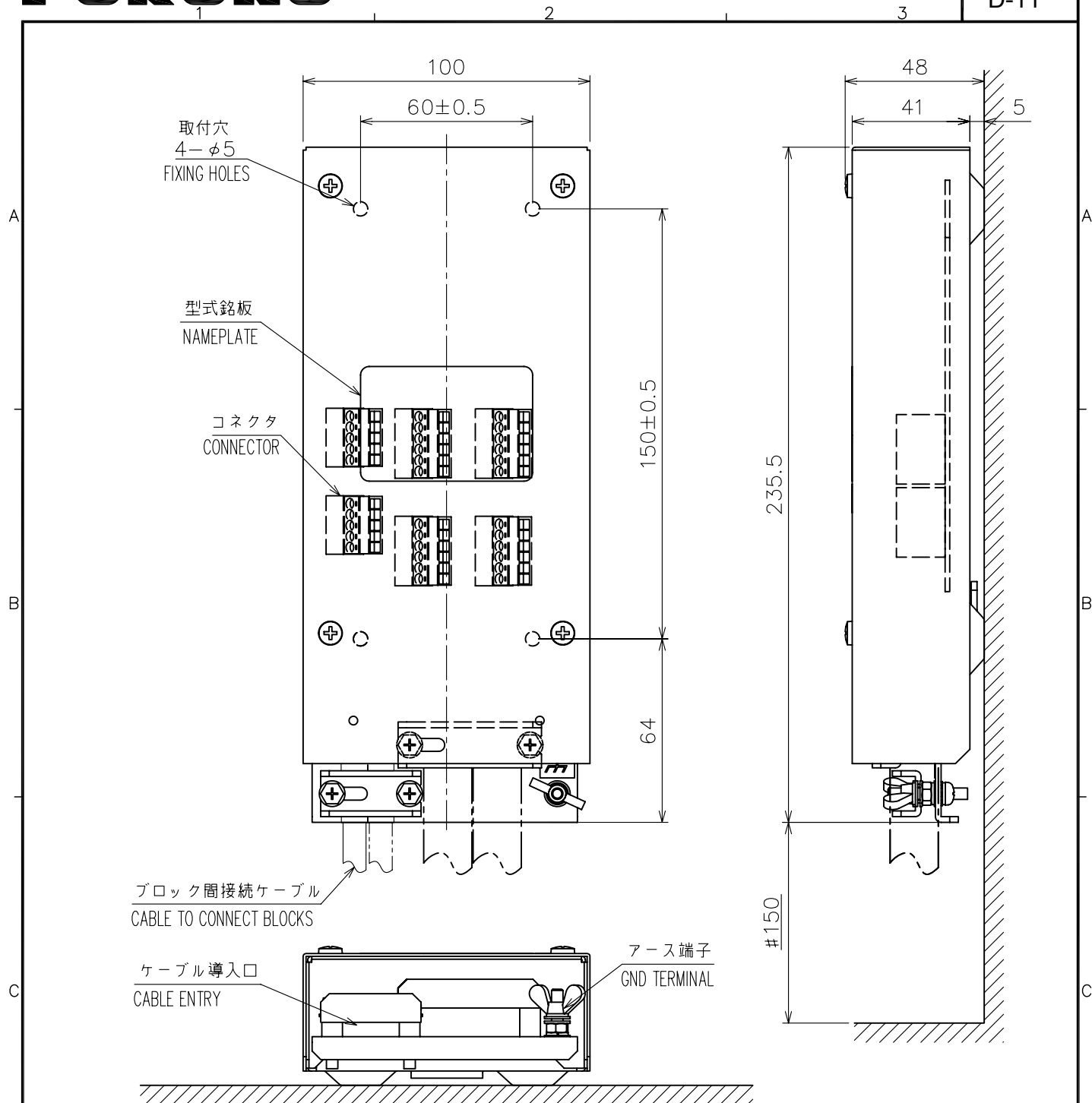


表1 TABLE 1

寸法区分 (mm) DIMENSION	公差 (mm) TOLERANCE
$L \leq 50$	± 1.5
$50 < L \leq 100$	± 2.5
$100 < L \leq 500$	± 3

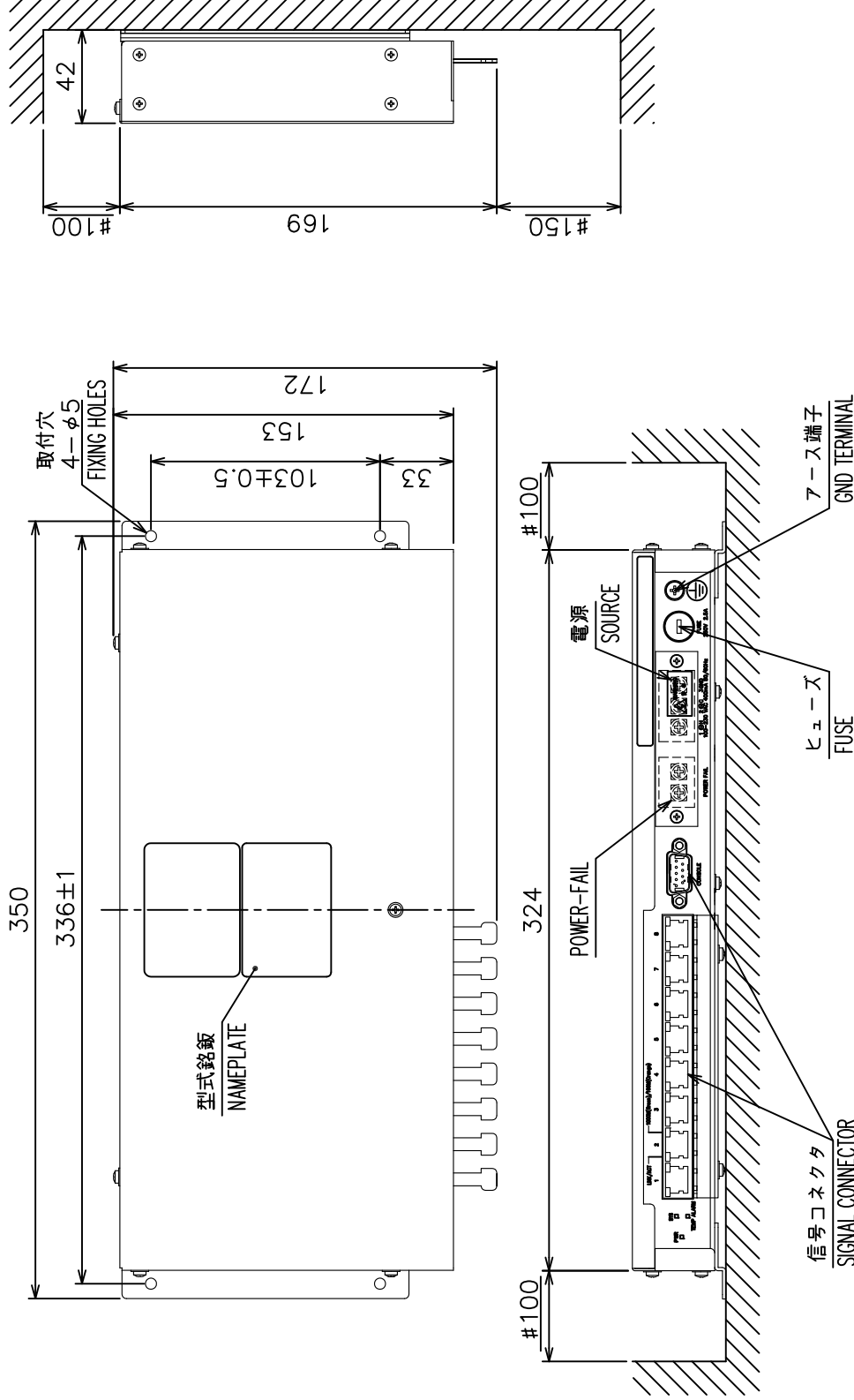
- 注 記
- 1) 指定外の寸法公差は表 1 による。
 - 2) # 印寸法は最小サービス空間寸法とする。
 - 3) 取付用ネジはトラスタップピンネジ呼び径 4×20 を使用のこと。

- NOTE
1. TABLE 1 INDICATES TOLERANCE OF DIMENSIONS WHICH IS NOT SPECIFIED.
 2. # MINIMUM SERVICE CLEARANCE.
 3. USE TAPPING SCREWS $\phi 4 \times 20$ FOR FIXING THE UNIT.

DRAWN	11/Jan/2012 T.YAMASAKI	TITLE	MC-3030D
CHECKED	11/Jan/2012 H.MAKI	名称	センサアダプター (デジタルアウト)
APPROVED	13/Jan/2012 Y.NISHIYAMA	外寸図	
SCALE	1/2	MASS	0.8 $\pm 10\%$ kg
DWG. No.	C4473-G11-A	REF. No.	24-014-230G-1
			質量はケーブルを含まず。 MASS DOES NOT INCLUDE CABLE.
		NAME	SENSOR ADAPTER (DIGITAL OUT)
			OUTLINE DRAWING

表1 TABLE 1

寸法区分 (mm) DIMENSION	公差 (mm) TOLERANCE
L ≤ 50	±1.5
50 < L ≤ 100	±2.5
100 < L ≤ 500	±3

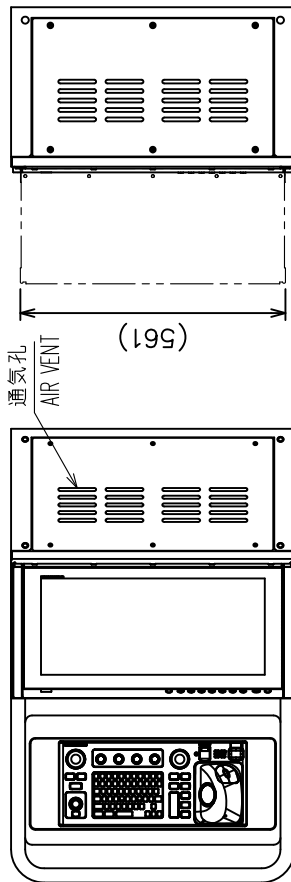


- 注 記 1) 指定外の寸法公差は表 1 による。
 2) # 印寸法は最小サービス空間寸法とする。
 3) 取付用ネジはトラスタッピンネジ呼び径 4 × 2.0 を使用のこと。
- NOTE 1. TABLE 1 INDICATES TOLERANCE OF DIMENSIONS WHICH IS NOT SPECIFIED.
 2. # MINIMUM SERVICE CLEARANCE.
 3. USE TAPPING SCREWS Ø4x2.0 FOR FIXING THE UNIT.

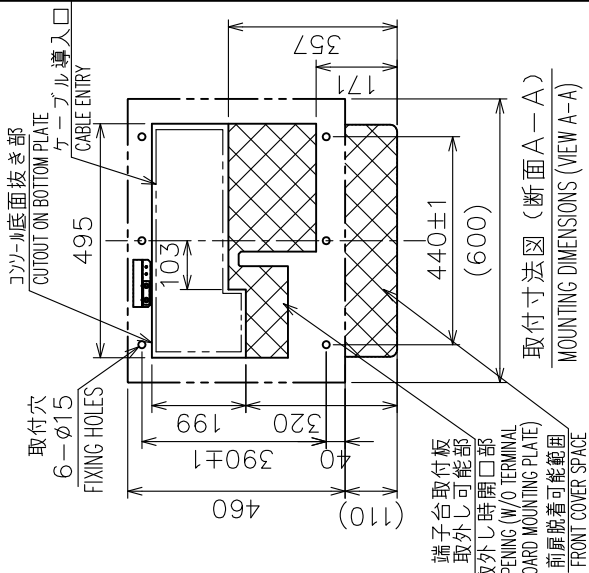
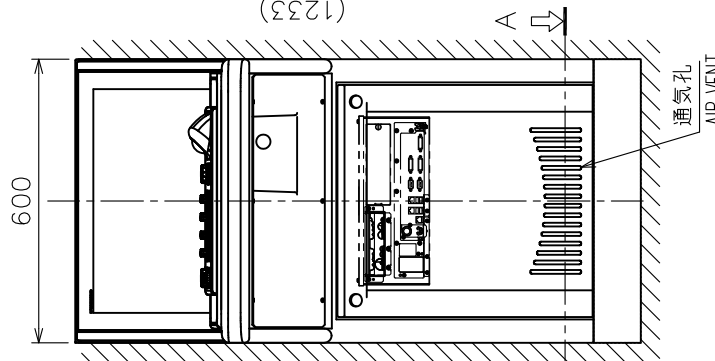
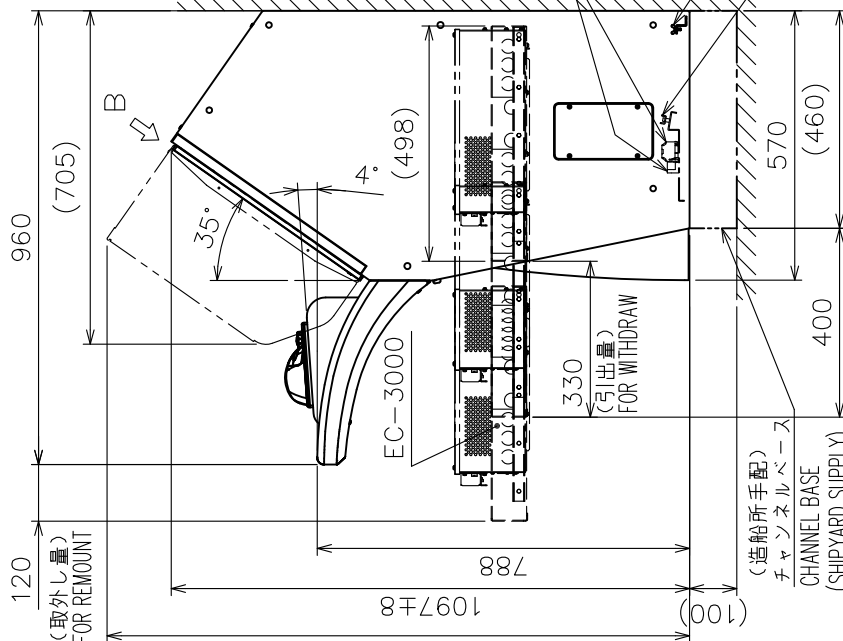
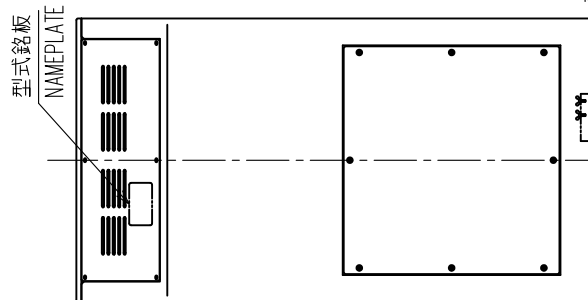
DRAWN	5/Nov/2012	T.YAMASAKI	TITLE	HUB-3000
CHECKED	5/Nov/2012	H.MAKI	名称	インテリジェントハブ
APPROVED			外寸図	
SCALE	1/3	MASS 1.5 kg	NAME	INTELLIGENT HUB
DMC No.	C4473-G12-B	REF No.	24-014-350G-2	OUTLINE DRAWING

表1 TABLE 1

寸法区分 (mm) DIMENSION	公差 (mm) TOLERANCE
$L \leq 50$	± 1.5
$50 < L \leq 100$	± 2.5
$100 < L \leq 500$	± 3
$500 < L \leq 1000$	± 4
$1000 < L \leq 2000$	± 5



矢視 B
VIEW B



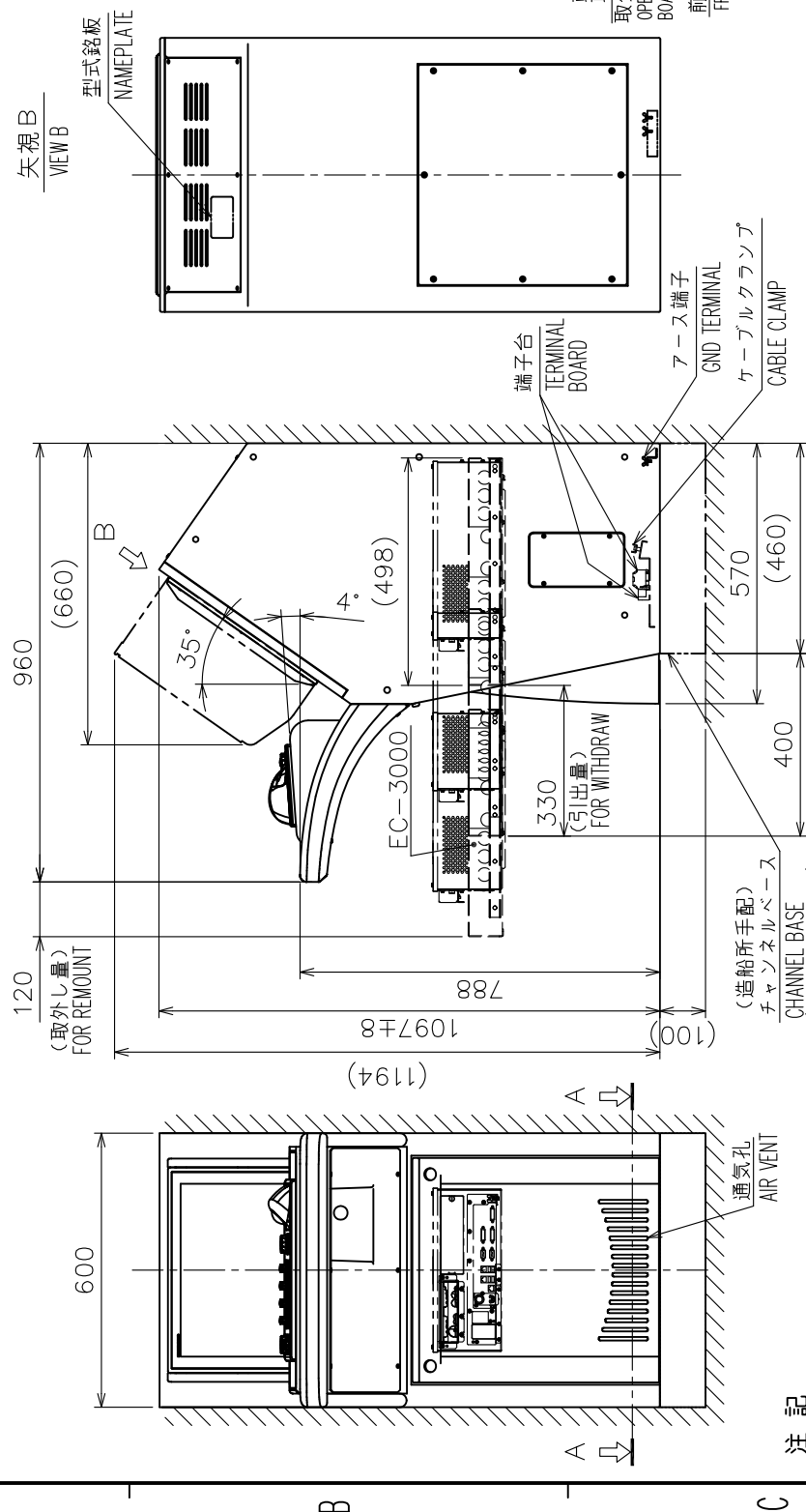
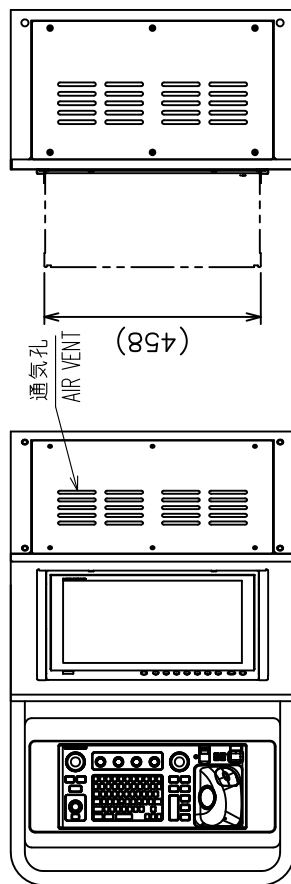
注 記

- 1) 指定外の寸法公差は表 1 による。
 - 2) 取付用ネジは M 1 2 ボルトを使用のこと。
- NOTE
1. TABLE 1 INDICATES TOLERANCE OF DIMENSIONS WHICH IS NOT SPECIFIED.
 2. USE M12 BOLTS FOR FIXING THE UNIT.

DRAWN	CHECKED	APPROVED	SCALE	DWG.No.	REF.No.	TITLE	名 称	名 称
27/Aug/2012 I.YAMASAKI	27/Aug/2012 H.MAKI	28/Aug/2012 Y.NISHIYAMA	1/16 MASS 146 ±0.05 kg	C4475-G01-A	24-014-310G-1	ECN-303	スタンダードコンソール	外寸図
								STANDARD CONSOLE
								OUTLINE DRAWING

表1 TABLE 1

寸法区分 (mm) DIMENSION	公差 (mm) TOLERANCE
$L \leq 50$	± 1.5
$50 < L \leq 100$	± 2.5
$100 < L \leq 500$	± 3
$500 < L \leq 1000$	± 4
$1000 < L \leq 2000$	± 5



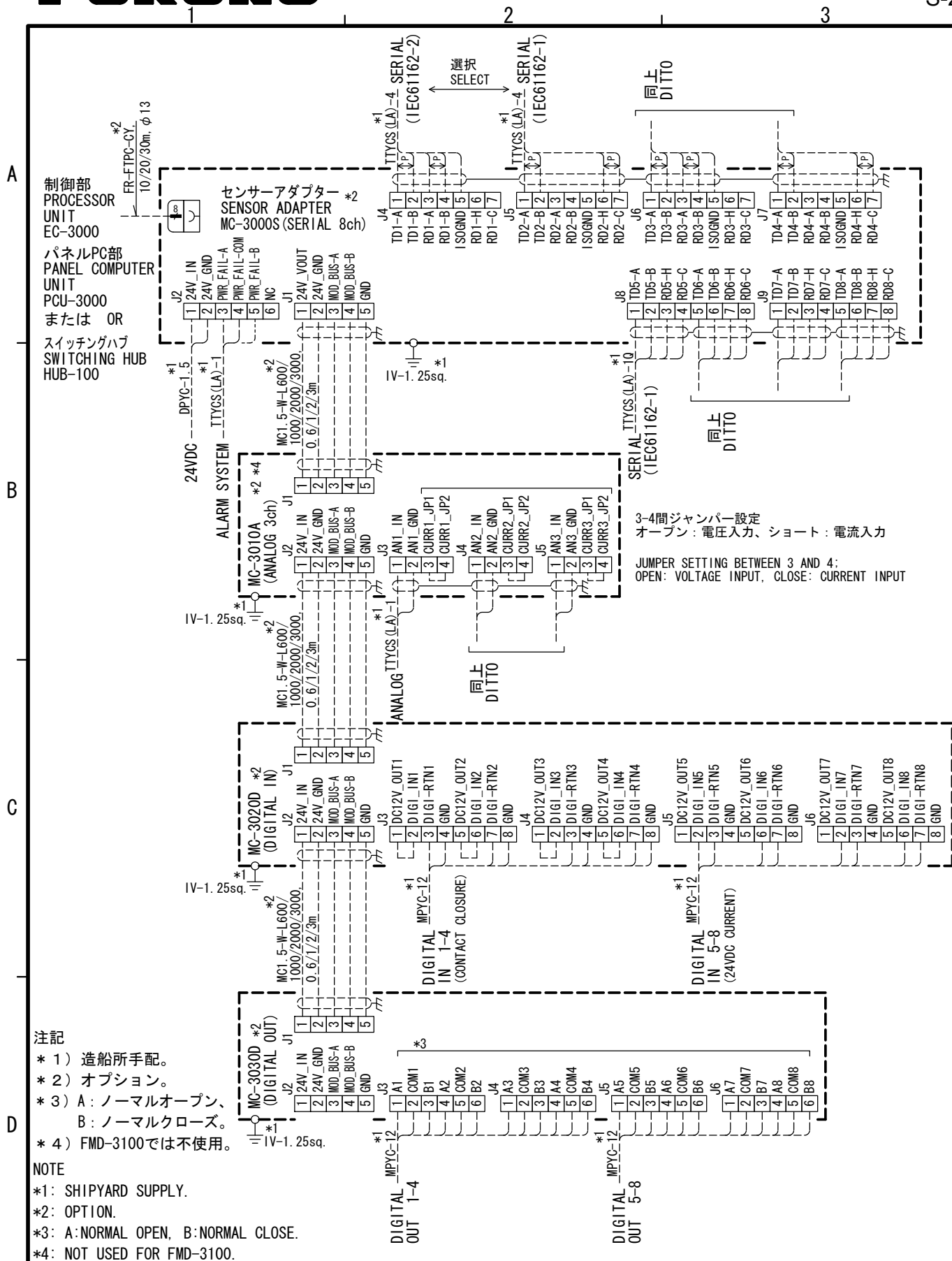
注 記

- 1) 指定外の寸法公差は表 1 による
- 2) 取付用ネジは M12 ボルトを使用のこと。

NOTE

1. TABLE 1 INDICATES TOLERANCE OF DIMENSIONS WHICH IS NOT SPECIFIED.
2. USE M12 BOLTS FOR FIXING THE UNIT.

DRAWN	27/Aug/2012 I.YAMASAKI	TITLE	ECN-304
CHECKED	27/Aug/2012 H.MAKI	名称	スタンダードコンソール
APPROVED		外寸図	
SCALE	1/16 MASS 142 100 kg	NAME	STANDARD CONSOLE
DWG.No.	C4473-G13-A	REF.No.	24-014-311G-1
			OUTLINE DRAWING



注記

- * 1) 造船所手配。
- * 2) オプション。
- * 3) A: ノーマルオープン、
B: ノーマルクローズ。
- * 4) FMD-3100では不使用。

NOTE

- *1: SHIPYARD SUPPLY.
*2: OPTION.
*3: A:NORMAL OPEN, B:NORMAL CLOSE.
*4: NOT USED FOR FMD-3100.

DRAWN 6/Jan/2014 T. YAMASAKI		TITLE MC-3000S/3010A/3020D/3030D	
CHECKED 6/Jan/2014 H. MAKI		名称 センサーアダプター	
APPROVED 6/Jan/2014 H. MAKI		相互結線図	
SCALE	MASS kg	REF. No.	NAME
C4473-C02- D		24-014-6003-2	SENSOR ADAPTER
			INTERCONNECTION DIAGRAM

